VOL. XXXI NEW YORK—THURSDAY, SEPTEMBER 10, 1914—CHICAGO No. 11

The AUTOMOBILE

France's Automobile Industry Under Army Control

Many Plants Being Used for Making Trucks, Aeroplanes, Cannons, Bombs and Cartridges

Touring Car Production Nil—May Ask Repeal of Non-Export Rule —Belgian Factories Closed

By W. F. BRADLEY

Special Representative of the Automobile with the Allied Armies

PARIS, Aug. 26.—Inquiries in the various automobile factories around Paris show that the production of touring cars is absolutely nil. In many cases important orders are in hand and a sufficient staff has been left to put work through if only permission could be obtained to export.

May Revive Export Trade

Efforts are now being made to obtain from the Minister of War a repeal of the order forbidding the exportation of automobiles and automobile parts, at any rate so far as regards allied countries. It is believed that the reasonableness of this request will be seen and that within a very short time it will be possible to send cars to England, and from there to other parts of the world. If this release is given it will allow the hundreds of chassis which are at the present moment lying on dock sides and in railway depots to be taken out of the country. The railway companies now appear to be in a position to undertake the transportation of goods; even if they cannot be relied on, manufacturers appear to be willing to undertake their own transportation as far as the coast. Even with the law against exportation repealed the volume of business can only be a mere driblet of what it was a month ago, owing to the lack of men in the shops.

A few of the factories have been militarized. In this case the original staffs have been retained, but the men are under military rule and work under the control of army officers for the army. Among these are Gnome, making aeroplane motors; Anzani, on the same class of work, and the aeroplane motor department of the Renault factory. The Blum-Latil factory, in which numbers of four-wheel-drive tractors are produced, is under military rule.

De Dion Bouton is under military law, with 1,000 men working on trucks, automobile cannon, and also on special work for the military arsenal at Puteaux.

Motobloc at Bordeaux is militarized.

Berliet is under military rule with 300 men working on trucks. The factory will deliver 180 trucks by the end of August and 250 by the end of September.

The Mors factory was militarized for a short time, but is no longer working for the army.

Saurer Busy Making Trucks

In addition to those firms directly responsible to the army authorities, several are working exclusively on army orders. Thus Saurer has been able to maintain a staff of 200 out of 800, which will be increased shortly to 400 or 450, all the men working on trucks or spare parts. This firm has 800 trucks on the fighting line.

Panhard is working almost exclusively for the

army and navy making trucks and war supplies.

Renault has stopped the production of touring cars and is building trucks for the war department.

Peugeot has been able to keep all three factories open with very reduced staffs, the work done being for the army. Robert Peugeot is serving as a lieutenant in an artillery regiment at the front.

The Mercedes repair shops near Paris have been taken over by the war department and are used as an extension to the military arsenal at Puteaux. The stock of finished cars at the firm's showrooms in Paris has been requisitioned for army service.

Bayard-Clement is working with 150 instead of 1,500 men, all of them engaged on airships and trucks.

Making Bombs in Alda Plant

Delaunay-Belleville is doing nothing but military work, this including material for the artillery service. Instead of cars bombs are being manufactured in the Alda factory.

Alcyon has closed down all but its motorcycle department.

Delahaye has had its commercial vehicle section militarized.

All other factories appear to be closed entirely or are merely keeping the spare parts department going. The Unic people have kept on 200 men, who are producing for stock, the company having a sufficient number of orders in hand to expect a quick release when peace is declared.

The Darracq big erecting shop has been turned over to the war department and is now used for making cartridges. Only the spare parts department is running. Most of the foremen have been returned from the war, the authorities having more men than they need, but workmen and supplies are not obtainable.

Charron, Vinot, Dietrich, Delage, Hispano-Suiza, are all closed.

Brasier is working with one-quarter of the original staff, but having received army orders will take on more men shortly.

Belgian Factories All Closed

Although little news is available, it may be taken that not a single automobile factory is working in Belgium. The most important works are Minerva, Excelsior, Pipe, Nagant, Herstal at Liege, and the Derihon works, where the B.N.D. steel is produced. The Derihon factory is close to one of the forts on the outskirts of Liege, where the most desperate fighting has taken place. No news has been obtainable of the fate of the works, which contain most valuable machinery, and it is feared that they must have suffered very severely. The Derihon brothers have a second factory on the French side of the frontier, which up to the present has escaped injury.

Trying to Capture Herstal

Herstal is also the small arms factory of Belgium. It is known that the Germans made a determined attempt to capture this, but when the last news came through they had not been successful.

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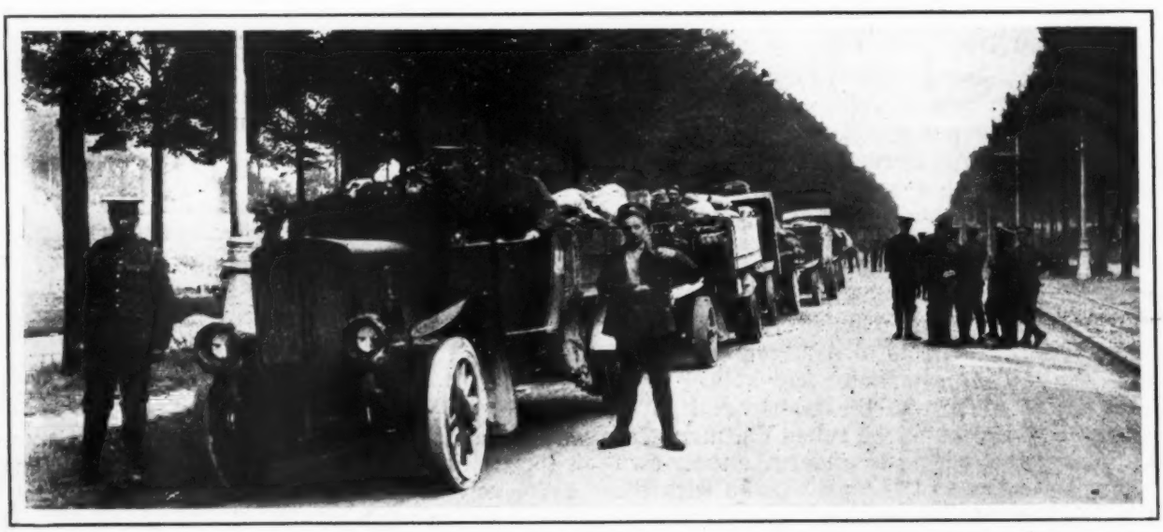
No European Automobile Shows This Year

PARIS, Aug. 31—It may safely be assumed that there will be no automobile shows in Europe this year, even if the war is of short duration. Under the most favorable circumstances they could not be held until the early months of 1915, but the probabilities are that they will all be abolished. No official decision has been taken in Paris, for it is impossible to get together the committees responsible for the exhibition. Henri Cezanne, general manager of the Paris show, and also secretary of the Chambre Syndicale des Constructeurs d'Automobiles, is at the seat of war. Louis Renault, the president of this syndicate, is in Paris.



A convoy of British motor trucks with the English troops in France ready to start for the front. It is estimated that there are from 2,500 to 3,000 British motor trucks in service with the army. The trucks move in convoys of from six to a dozen, each convoy being accompanied by an officer in a touring car who sets the pace and a number of motorcyclists who keep full control over the convoy. The trucks used in the English army are mainly requisitioned among truck users and manufacturers as the English subsidy system has not as yet been developed very fully and the result is little uniformity and even inadequate equipment

A touring car passing British army motor trucks on the road near the frontier of the allied army in France

British Trucks with Army in France

Number in Service Estimated at 2,500 to 3,000—Vehicles Move in Convoys of Six to a Dozen—No Uniformity

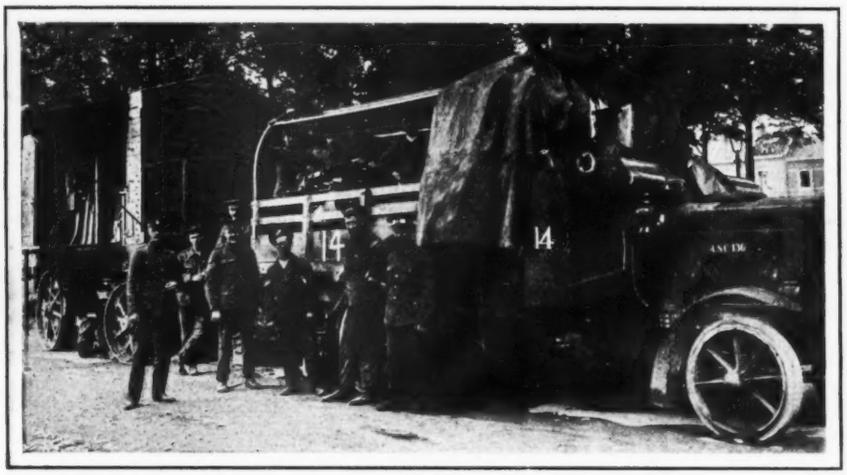
By W. F. BRADLEY

PARIS, Aug. 26.—For the first time in 100 years a great British army is operating on Continental Europe. It is recognized on all hands that the work of mobilizing the troops, carrying them across the intervening sea and moving them up to the fighting line has been a marvel of organization and precision. The work was done, too, with such secrecy that it is doubtful if a single person in Germany knew of it until the newspapers announced it officially on its completion.

Motor vehicles have played an important part in this work. England is peculiarly situated. Being a small, thickly populated country, with closely set towns and a network of railways, it has never been necessary for her to develop an army motor system for work at home. The possibilities of military operations abroad were so remote and of such an unknown nature that it was difficult to decide what form to give to mechanical traction. In this connection she was quite at a disadvantage compared with France. This latter country knew where war was likely to be declared, could build its army lorries and other motor vehicles to suit those geographical conditions, and could even test them on the possible seat of war.

I have just been able to get in touch with the English army in the field, and particularly to examine the work of the motor corps. With regard to the movement of officers, it should be noted that they never travel by train, notwithstanding the fact that the whole railroad system of France is at the present time in the hands of the military authorities. All journeys from the fighting line to the base, and all trips from the front to the War Office, in London are done by automobile. English troops land at Boulogne, Dieppe and Havre; the headquarters staff is on the Belgian frontier—or rather is at the present moment; where it will be when this matter appears in print is another question. The distances are from 130 to 180 miles. Thus by the use of fast cars officers landing at any of these ports can be with the headquarters staff within 4 hours. In the great majority of cases English cars are being used for this work. I came across a few American cars, which had evidently been requisitioned, their driv-

An army officer's car and a subsidized motor truck traversing a grade crossing in France



One of the trucks with the English army in France. Behind it is a motor workshop

How the French villagers greeted English troops on their arrival on French soil

ers having volunteered with the cars. Not only are the roads most suitable for high speed, but there is no traffic other than that of military officers. In a trip of 400 or 500 miles I did not see more than a dozen cars which were not on military service.

It is estimated that there are at the present time 145,000 British troops in operation against the German forces. The number of motor trucks in service is not known with accuracy, but may be estimated at 2,500 to 3,000. This, of course, excludes touring cars. The automobiles were brought from various English ports: Liverpool, Bristol, Cardiff, Portsmouth, Southampton, Folkestone, and were landed at Havre or Boulogne, or in some cases were brought up the River Seine to Rouen. From this point they traveled east under their own power to the main supply depots at the back of the British army.

Nearly all the supplies are brought up from the ports to the central depots by means of the railroad. One of the most important of these depots is Amiens, about 65 miles from the present fighting line. Here there are about 1,500 motor lorries engaged in the task of carrying provisions and ammunition daily from the base to the front. It is not less than a 6-hour journey. The vehicles can make the round trip in a day, then spend the second day in loading up and verifying the condition of the vehicles. On the morning of the third day the same trucks are ready to start out again for the journey to the front.

Paced by Touring Cars

The method of operation is for trucks to move out in convoys of from six to a dozen, each convoy being accompanied by an officer in a touring car, who always keeps at the head of the procession and sets the pace, and by a number of motorcyclists. One or two of the motorcycle riders survey the road ahead and a couple bring up the rear.

As the British army owns but a small number of motor trucks and has not developed its subsidy system very far beyond the paper stage, it has to rely principally on requisitions among motor truck users and what manufacturers' stocks are available. This is the weak feature of the system. Although the individual vehicles may be good, they are of such diversified types that they are not suitable for working together in convoy formation. There are exceptions. Thus, on one of the roads leading to the frontier I came upon a splendid convoy of sixteen Daimler 5-ton trucks carrying ammunition. All the vehicles were alike and moved along with as much regularity as if they were all linked together.

There were other convoys on the road with as many different makes as units, and with speed abilities varying from 7 to 17 miles an hour. Not only were they of different makes, but the bodies were of all kinds, for the trucks had been taken direct from private service, without even removing the ad-

English open-air kitchen at the army headquarters at Amiens, France

vertising matter that was on them. While it was possible to keep up a certain speed on the level, as soon as hills had to be negotiated the slower vehicles and the defective ones dropped back, thus delaying the entire convoy. Hilly country also necessitated passing and repassing, which, of course, was an element of danger. Not a few radiators were smashed owing to cars running backwards on the hills through being unprovided with sprags. With a closely placed procession, a rear movement of a few feet would be enough to cause an accident. These defects were known to the officers in charge of the motor service, but, of course, there was no time to remedy them when war had been declared.

The French authorities have worked on this problem a sufficient length of time to have created what may be termed a model type truck in all the factories. Although these vehicles differ considerably in design, they are uniform in power, size, speed, load-carrying capacity, body, clearance, tire sizes, and in such details as sprag, towing hooks, radiator guard, magneto and carbureter.

All Paris motor buses being at the war, this type of vehicle has been put into service. It runs on the main boulevards and has a woman conductor

One of the requisitioned motor trucks with the English troops in France

Touring Cars Do Well

While traveling over French roads I have been able to see the strong and the weak points of the English motor service. Touring cars are giving very little trouble, despite the hard work and rough usage they are receiving. In 3 days' constant driving I saw two breakdowns, and one of these was repairable. Where the trucks were manufacturers' stock, the service was also excellent and serious breakdowns almost unknown. But where trucks had come out of private service and were set to work together with little discrimination, there was plenty of material for the repairman. On one stretch of road over which several hundred trucks had passed cripples were to be found every 2 miles. The story was the same in every case: the vehicles were satisfactory for service at home on well-paved city streets, but when they were put on the open road in company with more powerful and faster units they had to be pushed to the limit and the lubrication or cooling system became inadequate.

A fine fleet of Daimler trucks all loaded with ammunition on their way to the fighting line

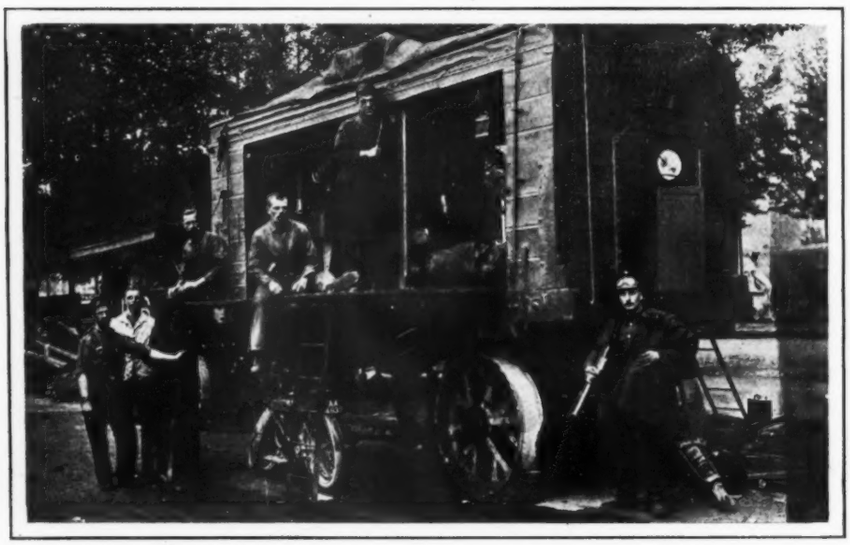
Motor Supplies from England

All supplies necessary for the British motor fleet have been brought from England. These include supplies of gasoline and oil. Thus although the trucks are at present working in a friendly country, they do not have to call upon the resources of that country. This is particularly important as regards the fuel supply, for although there is no shortage at present in France, the presence of a few thousand English vehicles requiring to be fed would have been an important matter. The general arrangements as regards the supplies not only for the motors but for the entire army, show the working of some master mind.

French War Trucks Superior to English

England Has More Vehicles But Lack of Uniformity and Preparation for Service Impairs Their Value

By W. F. BRADLEY



One of the British army motor workshops with the troops in France

FRANCE and England, fighting side by side against Germany, are both making extensive use of motor transportation for the feeding of their armies, the supplying of ammunition, and the removal of wounded. The governments of both countries have the power, in such times as the present, to requisition all types of motor vehicles, and both have made use of this power to the full.

Here the similarity between the Allies comes to an end. It is not a question of development of the commercial vehicle industry in the respective countries, or of the technical value of French and British vehicles, but of the adaptability of the vehicles as a whole to military purposes. In actual numbers of commercial motor vehicles in use, England is undoubtedly ahead of France; in technical development she is not inferior, but in the application of her fleets of motor lorries to military uses she is on quite a different plane from France. This is clearly seen now that the two nations are working side by side.

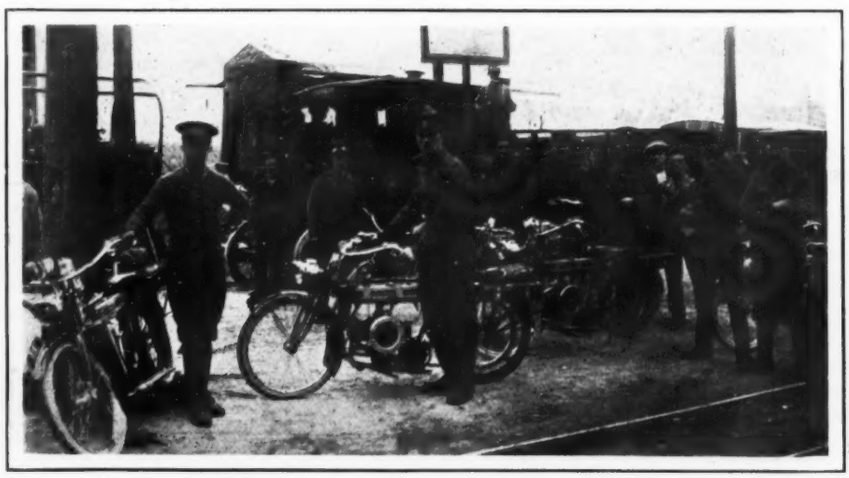
British Requirements

It is necessary to go back a considerable distance to understand the differences. England has developed motor transportation on purely commercial lines; she has developed it thoroughly, with a view only to the needs of the commercial user. When the British War Office became alive to the value of motor transportation, it had to deal with a well developed and highly specialized industry, the heads of which had been seeking to give the best possible value to the commercial user, unhampered by any consideration of military requirements. At a rather late date the War Office instituted a subsidy system and issued its own specification for army types. Manufacturers had to build to this specification, whether it was in accordance with their own technical program or not; they had to submit these subsidy types to special army tests, and finally had to convince purchasers that these new models were superior to the others.

In itself the army specification was not unreasonable. It was based on the Leyland chassis, a vehicle which had given excellent service. But it practically said to manufacturers: "You must abandon your own design, however good it may be, and accept ours." It said to users: "If you want the subsidy you must do without the detail features you consider necessary for your particular trade, and accept our type of vehicle." Under the circumstances it was hardly surprising that the British subsidy scheme failed to arouse any enthusiasm and in many quarters met with opposition. As proof of the indifference with which it was received, the last British army trials united three vehicles. The last French army trials had 110 trucks.

France's Preparation

The history in France has been entirely different. At a very early stage, in fact before commercial vehicles were a commercial success, the army was interested in them and sought to adapt them to their own use. Under the subsidy scheme, which has now been in application about 8 years, the regulations were of such a nature that practically every manufacturer was able to enter

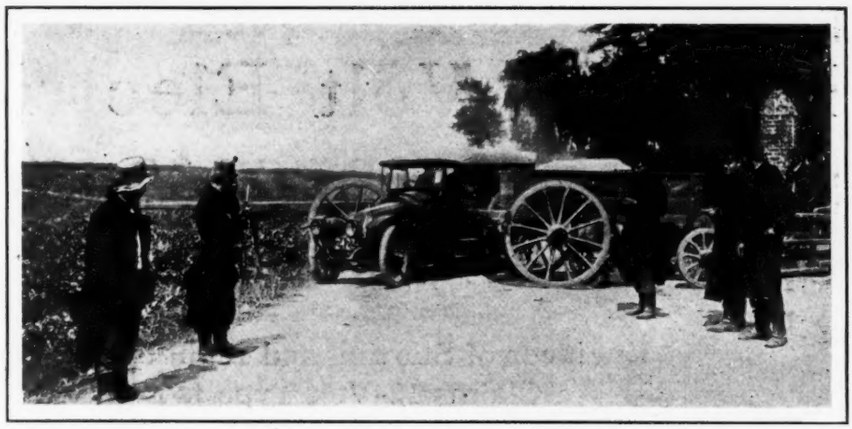


Motorcyclists attached to the British army motor corps in France

with the types he then possessed. Unlike the English scheme, there was no preference for bevel drive over worm or chains, for a particular type or position of motor, or for a certain class of gearbox. The field was even left open to steam, gasoline, and gasoline-electric. All that was required at first was that the trucks should be capable of doing good work on the road individually and collectively. Year by year the regulations and tests became more stringent, without, however, interfering with general design. The result has been that throughout France there has developed a type of vehicle of a uniform size, power, weight, speed, body, clearance, etc. In other words, the whole of the French construction has given military requirements prior consideration. The result is that when the war broke out practically all the best trucks in France were subsidized types, whether the owners were drawing the subsidy or not. Evene at this early stage of the war the French system has justified itself. It has been shown that it is much more important that a dozen vehicles from a dozen factories should be able to travel together over varied country at a given speed than that they should have the same design of crankcase or the same diameter crankshaft. Some of the features on which the army has insisted, and which are generally of little importance to the private user, have found their justification in actual war service. They are the use of sprags, efficient clearance, radiator guards, uniform bodies, towing hooks front and rear, three fuel carbureters, and tanks allowing a big range of action.

Special Provisions

In a few cases the British Army Service Corps has made arrangements to bring material direct from the ports to the fighting line. This appears to apply mostly to ammunition. It is at present too early to note what arrangements have been made by the English army for the use of trucks in carrying wounded soldiers away from the front Their vehicles do not appear to be capable of taking stretchers, and thus will practically be empty on return journeys. The French subsidy trucks, on the other hand, have a uniform type of body consisting of a platform with stout hoops over which a canvas cover is placed. The hoops have to be of sufficient strength to receive stretchers and wounded men; whenever there are men to be taken away the trucks are made use of for this purpose. If the English system is different from the French, it is because the medical service organization of the two armies is not the same. The English Medical Service Corps is equipped for the removal of wounded, and does not dovetail with the Army Service Corps.

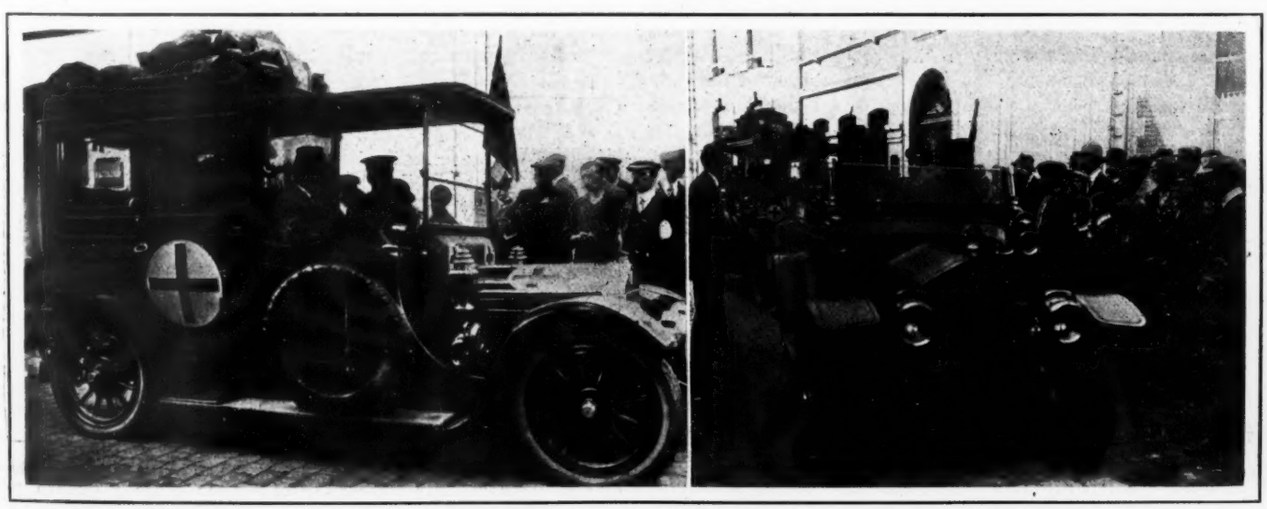


All Belgian roads are barricaded in this manner to facilitate arrest of spies. Cars can pass through only at a walking pace

Complete Motor Workshops

Each division has three or four motor workshops, which are kept in the open air garage at the depot town. At Amiens, where there were 1,500 automobile trucks, there were four workshops. These consist of a heavily built high-wheeled van with sides which can be hinged to open outwards so as to increase the floorspace. The roof is made to open and is covered by a waterproof canvas blind on rollers, serving to make the sides waterproof when the whole vehicle is closed up, or spreading out as a sunshade. The truck is drawn by a steam tractor. It is completely fitted with machine tools, lathe, forge, drills, saws, etc., and obtains its power from a single cylinder motor placed on the ground under the workshop and having belt connection through the floor. The French workshop is smaller, for it is an automobile chassis with a workshop body, the motor serving both to drive the vehicle and to operate the machinery.

A number of steam tractors have been brought over with the English army. Each one hauls a couple of trailers. The steam trucks are impractical for active work, however.



A Minerva limousine in the service of the British Red Cross Society in Belgium and France. Right—Red Cross touring car

Finds 12-Volt Electrical System Superior to 6-Volt

The Automobile Engineers' Forum

Engineer of Starting and Lighting System Manufacturer Claims 12-Volt Type Is Lighter, More Efficient and Easier to Install

NIAGARA FALLS, N. Y.—Editor THE AUTOMOBILE—Our experience with starting and lighting systems of different voltages has proved conclusively that the 12-volt is superior to the 6-volt system. We find it to be lighter, easier to install, more efficient, and to give better service.

Weight of 12-Volt System Is Less

The weight of a 12-volt starting motor is much less than a 6-volt motor designed to operate at the same speed, and to give the same torque. This is especially true in the case of a single unit system, that is, a combined motor and generator. There is also a saving in size and weight of the starting switch and wiring, which more than compensates for the difference in weight between a 12- and 6-volt battery.

The 12-volt system is easier to install, due to the greater flexibility of the smaller size of cable used, and to the reduction, in size of all accessory parts, such as switches, terminal posts and lugs.

The efficiency of both the motor and the generator is higher with a 12-volt system. The heavy current required by a 6-volt motor results in large losses in the wiring, switch contacts and brushes. The efficiency of the motor is thereby reduced and the cranking speed is cut down to such a low point that it is difficult to start on the magneto. In a 6-volt generator the brush contact and friction losses are much greater than in a 12-volt machine and consequently more power is required from the engine. In Europe, where fuel consumption is a very important factor, it is significant that 12 volts is the standard lighting voltage, and there the question of starting has never been seriously considered until very recently.

In service the car owners using 12-volt systems find that they have less trouble in keeping generators in operation, as dirty commutators do not interfere with the building up of voltage. The increased pressure is sufficient to overcome the resistance. The brushes have a longer life, saving trouble and expense of renewal. The 12- or 14-volt lamp that is now manufactured is as durable and strong as the service demands. Even higher voltage lamps are giving excellent service. Automobile electric lighting has become so universal that there no longer is the argument that nothing but a 6-volt lamp can be readily purchased.

12-Volt Systems Give Less Trouble

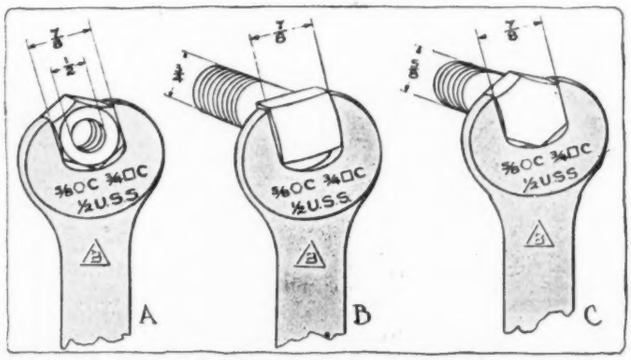
Together with the above advantages the 12-volt system permits the use of everything favoring simplicity in number and size of units, and in wiring. It is the best compromise between the advocates of high and low voltage and its more general adoption would do more than any other one thing to standardize the electrical system.—T. R. DU BOIS, starter department, United States Light and Heating Co.

In Ordering Wrenches Mention Number and Style of Finish

HARTFORD, CONN.—Editor THE AUTOMOBILE:—When a customer orders a wrench he probably wants it at the time of ordering, and wishes it to be delivered immediately. Under these conditions, if the dealer makes prompt delivery he will have pleased a customer who will remember where he can get his orders filled quickly. If the dealer is unable to fill the order by return mail because his customer has neglected to plainly specify what is wanted, everybody is sore on account of the delay, and trouble and expense is incurred by the necessity of writing to get complete specifications.

These same conditions often exist between the dealer and the manufacturer; that is, the delay in filling an order is caused by incorrect or incomplete specifications. The buyer has failed to make clear just what is wanted.

There are only two things necessary to specify when ordering drop forged wrenches, viz.: the number of the wrench and style of finish. However, it often happens that a customer has no catalogue handy and therefore tries to make clear his requirements by stating for what purpose the wrench is required. This is all right if the statement is properly and clearly put, which often times is not the case. For example—it often happens that the manufacturer gets an order for a wrench to take a ½-inch nut and fills the order accordingly with the result that he is asked to replace the



Illustrating several of the ways in which a wrench may be ordered wrongly. For instance, people often order a wrench to take a half-inch nut when they mean a nut with a half-inch opening. Square and hexagonal heads are also complicating features

wrench with one that has a ½-inch opening to take the nut.

Nuts are designated by the size of the tapped hole, or the size of the bolt on which they are used. Bolts and cap screws are designated by the size of the diameter of body or shank of same, therefore a half-inch U. S. standard hexagon nut requires a wrench with an opening measuring ⅞-inch.

Standard lists of drop forged wrenches, as a rule, cover three styles of finish, namely: Unfinished, Semi-Finished and Finished, and prices vary according to the style of finish required. Therefore, it is essential that an order should plainly state the style of finish wanted.

The head or heads of wrenches are stamped so as to show for what purpose the wrench can be used, according to our system.

For example, if the wrench is for a 3/16-inch U. S. Standard nut or bolt, the opening measures 13/32 inch, and the head is stamped "3/16 U. S. S."

If the wrench is for a ¾-inch hexagon cap screw, the opening measures 1 inch and the head is stamped "¾ C." If the opening of the wrench measures ⅞ inch, the head is stamped "⅝ ○ C, ¾ □ C, ½ U. S. S.," showing that the wrench can be used for ⅝-inch hexagon cap screw or ¾-inch square cap screw, or a 1-inch U. S. Standard nut or bolt. Also, a ⅜-inch opening is stamped "⅜ set, 3/16 ○ C, ¼ □ C," showing that the wrench will take a ⅜-inch set screw, a 3/16-inch hexagon cap screw, or a ¼-inch square cap screw.

Thinks Over-Standardization in Car Design Means Stagnation

NEW YORK CITY.—Editor THE AUTOMOBILE:—Information is wanted on W. A. Swan's automo pill. Mr. Swan wants everything standard; but does he realize that that is to spell stagnation, but in another way?

It is not fair to say that the U. S. government is throwing away money when testing alcohol as fuel; it is now at least conclusively proven that alcohol as fuel is too high in price for a long time to come. Mr. Swan will have a self-starting motor. Why tantalize us, Mr. Swan, you probably know how to produce such a motor? To the rest of us it seems to be an impossibility, at least when clutches are not to be used, or their equivalent. Gears are not going to be used either; but are you not a bit behind the times there? There are no difficulties in the way of running cars without a gearbox; a larger motor will do that nicely, but the trouble is that such an engine becomes very heavy, costly, and will use a great deal of fuel, since it will be but seldom called upon to extend itself to its full capacity.

A Constantly Economical Motor

Strange to say, all things are best under but one condition and to produce a motor that will be equally economical under all conditions, that alone, Mr. Swan, will be a feat worthy of your best efforts. I am surprised to hear that when I thought it was well understood that of all the gear systems the internal gear was the least efficient. There is no difficulty either to drive each wheel independently; but, again, you must have excessively heavy motors to do so, else two sets of gearboxes and gears you do not want.

No carburetor, no radiator, no camshaft, and the motor still not to be a 2 cycle, i.e., a 4 cycle then. The only tangible thing standing out is that the motor will be a modification of the Knight type. The motor is probably not cooled at all.

And the fuel comes in pills. The pill idea is wonderful, but how about going up a hill? Big pills for big hills and little pills for little hills? The prophetic eye sees boxes with pills distributed by parcel post.—B. H. BRITT.

Recent Decisions of the Courts

Explosion Not Gasoline Dealer's Fault

By George F. Kaiser

A GASOLINE dealer was recently held blameless by the Supreme Court of Tennessee for an explosion which occurred while a gasoline tank was being filled.

In this case a father told his 17-year old son to take his automobile around to a drug store and have the gasoline tank filled. The son drove to the store after dark, stopped his car, gave an order for gasoline, turned down the rear light and walked off a short distance to talk to some boys. The tank was hung in the rear of the car and was about 24 inches above the tail lamp, which was lighted and had two glass sides but a metal rear through which the light did not show. Before going away the son turned the tail lamp down very low. The drug clerk brought out a 5-gallon can of gasoline and, not noticing the light, started to fill the tank, from which the cap had been removed. After he had poured in about 1 gallon the vapor reached the lighted lamp and an explosion resulted which injured the car. The owner thereupon sued the dealer for the damages but the Court held that the clerk had the right to assume that the son had put the car in a proper condition to receive the charge of gasoline and that the boy should have extinguished the light instead of turning it down, or else should have stayed by the car and warned the clerk instead of walking away. Judgment was therefore rendered in favor of the dealer.—*Grigsby & Co. vs. Bratton*, 163 *S. W.* (*Tennessee*) 804.

Bicycle Against Automobile

Where a bicyclist tries to shoot across in front of an automobile, he cannot sue and get damages from the motorist for his injuries, says Maine Court.

A bicyclist sued a motorist for injuries received in a collision between his bicycle and a motor car. He recovered a judgment of $39.55. The motorist carried the case to a higher Court and succeeded in having the bicyclist's case dismissed. The automobile was on the right side of the street and the bicycle was coming along in the opposite direction. There were lights on the automobile but none on the bicycle.

The Court held that, as the bicyclist wanted to "shoot right across to get clear of the automobile" when he could have turned the other way and gone behind the motor car, he himself was so guilty of negligence as to make a dismissal of his case proper.—*Robischaud vs. Spence*, 90 Atl. (Maine) 430.

Trolley Smashes Automobile

Minnesota Court says that a motorist cannot get back the money he spends repairing his car when it is smashed by a trolley if he does not stop on seeing the car 10 ft. away.

A motorist sued a Trolley Company to recover back the money he had paid for repairs to his car, which was damaged in a collision with a trolley. He testified that as he came to a crossing he looked for a trolley and the way was clear when he was 35 ft. away. When he was within 10 feet of the track he looked again and a car was "right on top of him." He turned to the right, pulled his clutch and put on his brakes but was hit.

The Court said that, as the motorist could have stopped his car but instead went on and took a chance, he was guilty of contributory negligence and could not recover.—*Batroot vs. St. Paul City R. R. Co.*, 146 N. W. 1107.

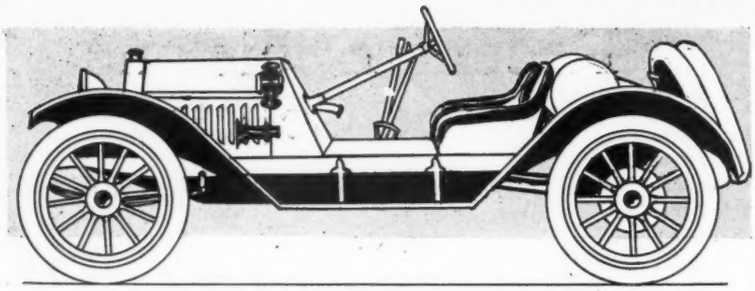


Fig. 1—Model 34 Buick with racy runabout lines

The Rostrum

Two-Stroke Cycle Ideal

EDITOR THE AUTOMOBILE:—The opinions of various readers, and some thinkers, on the two-stroke cycle is certainly an interesting feature of your magazine. A few ideas from another source may help those who are so fascinated with the valve or no valve problem as I am. When a traveler finds himself lost in a bewildering region and every trail leads to an unknown country, wisdom bids him retrace his steps to the fork of the roads on the mountain. Let us, also, go back to that fork on the mountain. At our feet lies the empire of the heat engine—to the east, the reciprocating engine is all-powerful; while to the west the Turbine kingdom lies. The light of knowledge has already risen on the east, so let our journey lie there. Whatever may be the thermodynamic cycle chosen, both four-stroke and two-stroke mechanical cycles can be invented to accomplish it. Wisdom again says, "Take the road of the two-stroke cycle, for it has the inherent advantages of simplicity and doubled power output." That these ideal features have not been successfully realized is a serious charge against our most capable engineers, who have spent time in developing the four-stroke cycle engine. I will say nothing about the numerous forks further down the road. I do say, however, that a mountain must be blasted—the volumetric efficiency must be greatly increased. The low volumetric efficiency and the fuel extravagance of the two-cycle are the results of poor design and the poorer inventive ability. Both conditions will be bettered by the same design. When the engineer breaks through to this region, he will see wonders of which we have never dreamed; torque as smooth as that of an electric motor; efficiency greater than that of a Diesel engine; silence made absolute and vibration wholly eliminated; weight reduced to a pound a horsepower. Being a mere man, he blinks his eyes and steps on his own foot—can he be in the land of the reciprocating engine—is this not the country of the turbine? My friends, he can believe his eyes and so will you very shortly. It can be done, it has been done, and without a make-up, too.

Providence, R. I. H. A. B.

Magneto Causes Miss

Editor THE AUTOMOBILE:—1—I have a car which starts badly. It has a four-cylinder, 4.25 by 5.5-inch motor, but only a magneto for ignition. It has not troubled me this way until recently. At the beginning I could start the motor with but a turn or two of the crank at any time. The motor works evenly and has lots of power when once under way. If it can be started rolling down a grade and then thrown into gear it starts readily enough. The carbureter adjustments have been changed, but the motor works so well it seems impossible that the trouble could be there. I use the dash adjustment for starting, but it does not help matters. Can you tell me the cause of this and suggest a remedy?

Canton, N. Y. H. S. S.

—Your magneto is probably causing the trouble, although it is well to make sure that the difficulty does not lie in the carbureter adjustment or is not due to leaky valves.

See that the spark plugs points are 1-32 inch apart, that all connections are tight, and that there are no short circuits. Then examine the breaker points on the magneto. File them until they meet squarely and then adjust them until the motor runs evenly at all speeds. The exact distance depends upon the magneto, but should be somewhere between 1/32 and 1/64 inch. If the points are too far apart the motor will not start or will miss at slow speeds, while if the points are too near together it will miss at high speeds. There is also a chance that the magnets are weak. If this is the case, there still will be difficulty in obtaining a spark at low motor speeds. Make sure that all the brushes are making good contact.

It is well to note that starting on the magneto will be facilitated by advancing the spark nearly all the way.

Cost of Raceabout Body Is $100

Editor THE AUTOMOBILE:—1—Could you advise me in the Rostrum how to cut down a model 34, 1912 Buick runabout, "A la Mercer"? Give a sketch if convenient.

2—What is the estimated cost of this car?

New York City. G. F. K.

—1—Fig. 1 shows how this car should look after being remodeled. The dash is slanted slightly, the bucket seats are placed directly on the frame and the gasoline and oil tanks, and tires are carried in the rear as shown. The steering post is dropped so that it will be in reach with the lower seat position. This is accomplished by loosening up the dash bracket that holds the steering column.

If you also desire to increase the speed of the car you should follow the directions given in the issue for August 27 in the Rostrum on page 406.

2—The cost will be anything from $100 up, depending on how well the body is finished and who does the work. It would be best to obtain estimates from several body builders.

New Use for Old Shoes

Editor THE AUTOMOBILE:—I have seen the idea advanced that when tires are rim cut and the treads are still good that the bead could be taken off and the remaining tire fitted over the casing of a good tire while deflated. Pump up the tire and you have a practical puncture-proof and-long-running tire. I want to know if any of your readers have tried this. Is sand liable to work between the two casings? Would there be enough friction to heat and harm the under casing?

Back Bay, Wis. W. B. DULING.

—There is a possibility that sand would work in and cause trouble. Some slight harm might also be done by heat. The experiences of our readers on these points would be interesting.

Lamps Out of Focus

Editor THE AUTOMOBILE:—I have a motor car equipped with the Gray & Davis electric lighting system. So far as the efficiency of this outfit is concerned, there is no fault to be found. The bulbs in the headlights are bright enough, but the light on the road is bad—simply a series of light and dark rings. However I may try to adjust the focus the result is the same, while the diameter of the circle of light on the road is only about 12 feet at a distance of 20 yards. Will

you please tell me what is the matter, and how I may get rid of those rings?

Jamaica, West Indies. JAMES JOHNSTON, M.D.

—If the focusing apparatus is in proper working order and you are using the right size of bulbs, you should have no difficulty in eliminating the rings, as this trouble is due to lack of focus. The construction of the apparatus is shown in Fig. 2, where it will be seen that the position of the bulb is changed by a system of levers that is controlled by the nut at the top of the lamp. It is barely possible that a pin has dropped out or some other small derangement has occurred to prevent the proper focusing. It seems most likely, however, that the bulb is not the proper size.

Maker of First Automobile

Editor THE AUTOMOBILE:—1—Who made the first automobile? What year? Describe it.

2—How many factories in the United States to-day are making cars and trucks?

3—How many men are earning their living in these factories?

4—What particular improvements on cars gave them reliability?

5—What is the approximate number of cars and trucks in use to-day in the United States and their value.

Scranton, Pa. JOS. J. CURT, JR.

—1—This is a difficult question to answer, because self-propelled road vehicles appeared shortly after the invention of the steam engine, and as a natural consequence of it. The first one we have any record of is Cugnot's steam carriage, built in 1770. This is illustrated in Fig. 3. The boiler is carried in front and drive is through the front wheel. It was capable of carryng four people at a speed of 2.25 miles per hour on an ordinary road. As its boiler capacity was insufficient, it was not able to run more than 15 minutes before pausing to get up steam.

The kettle-shaped boiler is characteristic of the day; the fire and water tube boilers had still to be invented.

The single front wheel, which is of great strength and weight, is driven by two single-acting vertical cylinders 13 inches in diameter by 13-inches stroke. These two pistons are connected by a walking beam to which they are coupled by chains attached to levers mounted on the axle of the driving wheel. They alternately work the front wheels by pawls acting on two modified and reversible ratchet wheels. The distribution of the steam to the two cylinders is effected by a four-way cock, so arranged that in each position it opens one cylinder to the steam supply and the other to atmosphere. It is operated by a tappet motion from the piston rods. The rear part of the machine was connected by a vertical bolt to the front wheel, and by means of gearing from the driver's seat of the fore carriage can be turned through 50 degrees, thus enabling the driver to steer the carriage.

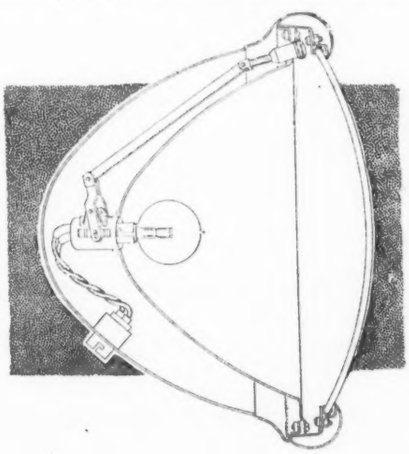


Fig. 2—Gray & Davis electric headlight, showing bulb focusing mechanism

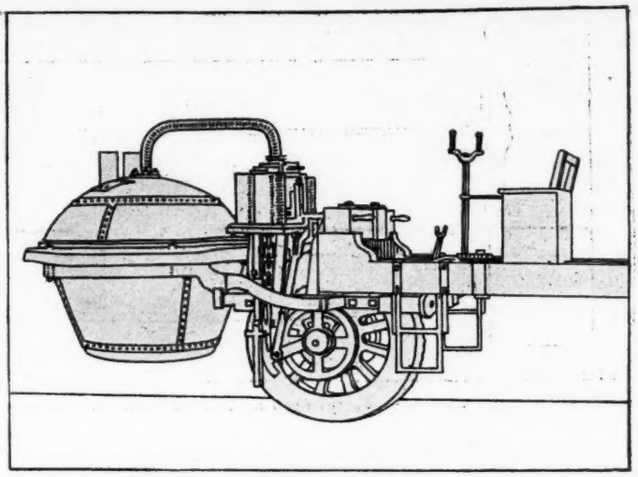


Fig. 3—Cugnot's steam carriage, built in 1770

2—The total number of manufacturers, according to the *Automobile Trade Directory*, is 436, distributed as follows: Gasoline pleasure cars, 171; electric pleasure cars, 24; steam pleasure cars, 2; cyclecars, 29; gasoline commercial vehicles, 188; electric commercial vehicles, 22.

3—This is unobtainable.

4—Reliability has been achieved mainly by the perfection of details, due to experience. Little by little, the proper materials, proportions and size of parts for best service have been determined. Reliability has not been obtained by changes in principle to any extent.

5—Slightly more than a million and a half vehicles were in use at the beginning of July. The total value is not known.

Motor Fires Irregularly

Editor THE AUTOMOBILE:—My motor does not fire regularly. Sometimes it misses on just one cylinder and then again two become affected. The missing skips around from one cylinder to another. The position of the gas and spark levers does not seem to make any difference, and the trouble is equally bad on both magneto and battery. The magneto is a Splitdorf. Every adjustment of the carbureter, which is a Schebler, has been tried, and other carbureters have been put on, but without success. The spark plugs have been changed.

The motor has been completely overhauled by a competent mechanic.

Earlhorn, Ia. GEO. PHILLIPS.

—There are many places where you might find trouble according to the symptoms you have described. Since the missing is not confined to one cylinder, however, the spark plugs must be in good condition. Probably, also, the valves do not need regrinding, nor is the trouble due to lack of compression from any other cause.

The missing is undoubtedly caused by faulty ignition or carburetion, and it seems more likely that the former is the cause.

First look for short circuits. Operate the motor in the dark, at a moderate rate of speed, and note whether any sparks jump from any part of the wiring to the motor or frame. Inspect the insulation of all the wires carefully for worn or broken spots, where a short circuit to the frame might be produced. Any such spots should be taped or the wires replaced. See that no exposed parts, such as terminals, are able to come into contact, even momentarily, with any metal parts that might ground the current.

Next examine the brushes on the magneto. Any that are worn on the ends should be smoothed off or replaced, so that a good electrical contact is obtained. The springs that force

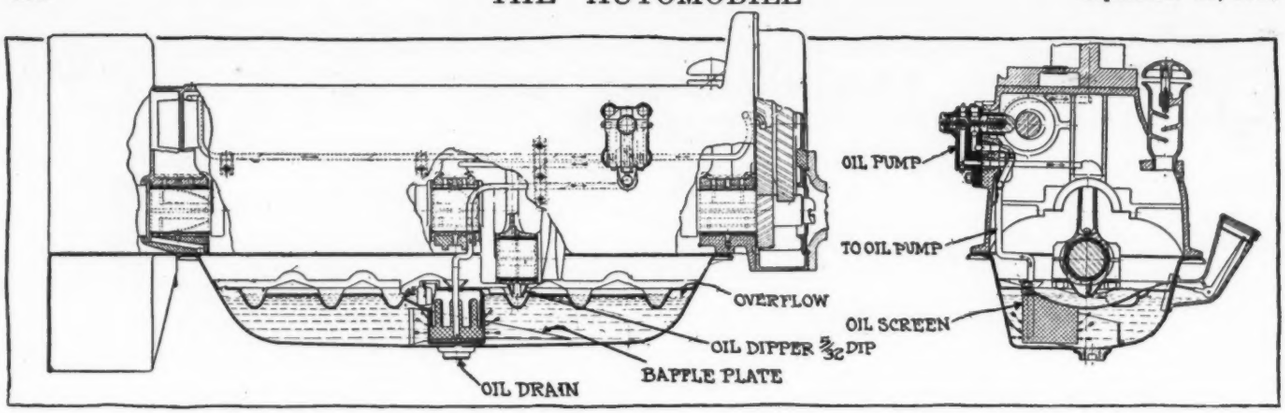


Fig. 4—Oiling system used on 3.75 by 5-inch Continental Six. A combination of splash and pressure feed is used

out, or feed, the brushes should have enough tension to make a good contact, and if any are too weak new ones should be substituted.

See that the breaker points are smooth enough to meet squarely and in adjustment—that is, the gap between them, when they are separated, should be between 1/32 and 1/64 inch. Also note whether the insulation in the breaker box is in good condition, and whether there is any possibility of a short circuit either due to this cause or dirt or oil. Wash the breaker mechanism well in gasoline before replacing. See that there is no dirt in the spark gap that might cause a short circuit.

Take the switch apart and examine the insulation and tighten up any loose parts.

Then, providing all electrical connections are tight, and the gaps of the spark plugs are adjusted to about 1/32 inch, the trouble must either be in the carburetion system or else is in the coil or magneto. In the latter case take your car to a Splitdorf service station.

Assuming that the carbureter adjustment is about correct, see that there are no air leaks in the intake manifold. This fact can easily be determined by running the motor and holding a cigarette at the various joints. If there is a leak the smoke will be sucked in. The trouble may be caused by a worn gasket or some of the flange bolts may be loose.

Look for dirt in the gasoline system and see that the float is not soaked with gasoline and that the needle valve and float valve or their seats are not worn.

Description of Continental Six Oiling

Editor THE AUTOMOBILE:—Will you please describe the oiling system used on the six-cylinder Continental motors?

St. Louis, Mo. E. H. K.

—Two oiling sytems are used; one is a splash system employing a gear pump, Fig. 4. This is found on the 3.75 by 5.25-inch motor, while a plunger pump is used on the 3.5 by 5-inch motor.

In the former, the pump, which is driven by spiral gears, forces the oil through three pipes which lead to the three main bearings of the crankshaft. The oil which is not used up here overflows into the splash pockets of the oil pan, where it is picked up by the connecting-rod dippers, thus lubricating all exposed bearing surfaces inside the motor.

On the larger motor a plunger pump operated from a single eccentric on the cam shaft is used, the oil being drawn through a single lead from the tank and forced through three separate leads to the main bearings.

Gasoline Consumption Is High

Editor THE AUTOMOBILE:—I have a two-cycle Elmore, model 36, and cannot get over 6 or 7 miles to the gallon of gasoline. Is there any attachment that could be connected to the carbureter that will increase the number of miles per gallon? It is a Schebler carbureter and the engine works all right in every other respect.

Greensburg, Pa. E. G. SHEETS.

—This consumption is not unusual for this particular make and model. You might improve it somewhat by adjusting the carbureter to give a very lean mixture, running with spark advanced as much as possible, and reducing the friction of all parts to the minimum. You might also attach a gasoline economizer.

Worn Cylinders Cause Smoking

Editor THE AUTOMOBILE:—I have a 2-ton truck which has only been driven about 7,000 miles and has had the best of care. It runs all right now with the exception that it smokes a great deal regardless of how little oil I carry in the crankcase. I am also very careful about the sight feed on the dash not feeding too quickly. I have been told to drill holes in the oil grooves near the bottom of the pistons to allow the excessive oil to pass down through the inside of the piston back to the crankcase. Do you think this will prevent further smoking?

New York City. E. A. C.

—The only explanation is that the cylinders are badly worn, either through abuse or accident. The best remedy is to rebore the cylinders and fit new rings and larger pistons, but relief can be obtained in the way you suggest, namely, by drilling holes in the oil grooves in the bottoms of the pistons.

Truck Should Ride Better Loaded

Editor THE AUTOMOBILE:—1—We are using a 3-ton Mack truck with a twenty-six-passenger body. We find that unless it is fairly well loaded, the car rides hard. We thought that by the use of shock absorbers we could make the car ride more easily. Do you think this is so?

2—Can you advise us where we can obtain absorbers suitable, at a moderate price?

Bath, N. Y. BUCHMASTER & MORRISON.

1—Shock absorbers should improve the riding qualities, but it is natural that the truck should ride harder when empty. The springs of this vehicle, the same as any other, whether it be a pleasure car or a buggy, are designed for the maximum load, and therefore the truck rides best when this load is applied.

2—We suggest that you write some of the following manufacturers of shock absorbers:

Connecticut Shock Absorber Co., Meriden, Conn.
Cox Brass Mfg. Co., Albany, N. Y.
Ernst Flentje, Cambridge, Mass.
Gabriel Horn Mfg. Co., 1407 40th street, Cleveland, O.
Hartford Suspension Co., 172 Bay street, Jersey City, N. J.
Martin Shock Absorber Corp., 1301 E. Slauson avenue, Los Angeles, Cal.

Clarence N. Peacock, 1790 Broadway, New York City.
Peteler Shock Absorber Corp., 1997 Broadway, N. Y. City.
J. H. Sager, 265 South avenue, Rochester, N. Y.
Westinghouse Air Spring Co., Smedley Bldg., New Haven, Conn.

Carbureter Causes Missing

Editor THE AUTOMOBILE:—I have a 1913 runabout, and it has a miss somewhere. At low speed it runs very well, but every 10 or 15 revolutions it seems to have an extra exhaust, and when attempting to speed up the motor one or more cylinders will miss until the speed gets high, and then they will all hit. It does the same thing on the road. I have rewired from the magneto to spark plugs and changed spark plugs several times. Do you think it is the fault of the carbureter? If so, what would you recommend?

Somerset, Ky. ROY J. MCDANIEL.

—You seem to have carbureter trouble. Adjust your carbureter carefully, and if you do not understand how to do this properly take your car to a competent repairman. If the motor still misses it would be well to install another carbureter.

It is possible, also, that the breaker points on the magneto are out of adjustment, or that the magneto is at fault elsewhere. See the answer to George Phillips' letter in this issue, page 489.

Spark Plug Pump All Right

Editor THE AUTOMOBILE:—I have been informed that the use of an impulse pump for inflating tires will in time cause a noticeable knock or pound in the motor. If so, would you kindly explain?

Sayre, Pa. J. W. G.

—There is no reason why a spark plug pump should cause a knock in the motor. It is entirely separate from the motor, as far as its moving parts are concerned. Only the lower end comes in contact with the cylinder, and this has no more effect on the motor than a spark plug. The movement of the piston in the pump is produced by the compression pressure. There is mechanical connection between the pump and the motor.

How Car Drives Through Springs

Editor THE AUTOMOBILE:—Please explain the meaning of the phrase, "Car drives through springs."

Milwaukee, Wis. W. F. BREHM.

—This expression is almost self-explanatory. It means that the driving force exerted on the car body by the wheels is transmitted through the springs instead of through a torque-tube or radius-rod construction.

The three methods of driving are illustrated in Fig. 5. At the left is shown how the drive is taken by the springs. The forward thrust of the wheels, which is exerted first on the axle, is transmitted to the body through the front ends of the springs. No force can be applied at the rear ends of these springs because of the shackle construction. The forces are indicated by the direction of the arrows.

The use of radius rods to transmit the driving effort is illustrated in the center. It will be noted, in this case, that the springs merely carry the load and that all the strain of propelling the car falls on the radius rods. These are pivoted to the frame by means of ball and socket joints and are fastened to the axles by collars which allow full radial movement.

In the torque tube construction, at the right, the driving force is transmitted to the car through the pins P. In principle this is the same as the radius rod just described, but this member has another function also. Since the tube is fastened solidly to the axle, any tendency of the axle to rotate when the driving torque of the wheels is applied, is resisted by this member.

Breaker Points Too Near

Editor THE AUTOMOBILE:—I have a 1913 touring car which is not working satisfactorily of late and would like to know the reason for this.

I had the car overhauled recently on account of valve trouble with two cylinders. Had new piston rings installed, and also other parts which were necessary. The car now has good compression on all cylinders, but does not pick up and take the hills the way she should. I have tried this with the spark lever in different positions, but with no improvement. I also had the carbureter, which is a Rayfield, overhauled and adjusted. The car throttles down satisfactorily on high speed, almost to a walk, but on a long, steep hill she will slowly decrease in speed until engine is just turning over, necessitating changing to a lower speed.

Brooklyn, N. Y. PETER KAMINSKI.

—Possibly the motor is merely stiff and that after the new parts are worn in the car will accelerate properly. Also, it may be that in reassembling the motor the timing of the valves or magneto was incorrectly done. More likely the former, because the motor would either overheat or knock if the setting of the magneto was much out of the way. There is some chance too that the points of the breaker are too near. Make certain that the brakes are not dragging.

Relative Power of I and T-Head Motors

Editor THE AUTOMOBILE:—Will you kindly tell me what percentage of horsepower an overhead valve motor will develop over a T-head motor of same bore and stroke?

Sturgeon Bay, Wis. C. C. DONA.

—The exact increase, if any, with the overhead-valve construction depends on so many things that it is impossible to give definite figures. The exact design of the combustion chamber; the size, lift and timing of the valves; the shape and size of the intake and exhaust manifold, and the position of the carbureter all have their effect.

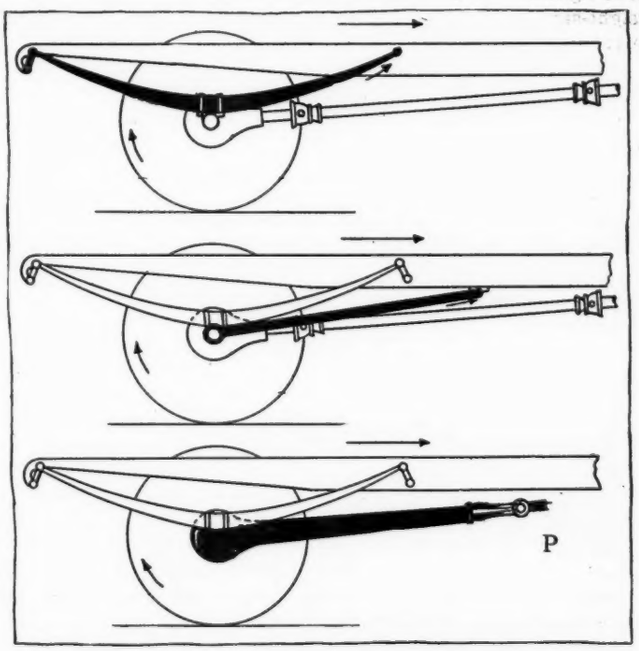


Fig. 5—Diagram showing the three methods of transmitting the driving force from the axle to the frame. The top one shows how the drive is taken through the springs, the middle one by radius rods and the lower one by the torque tube. The blackened member in each case is the one carrying the stress

The Engineering Digest

For What Speed Should a Motor Be Designed to Give Maximum Power For Its Weight?

A BRITISH ARGUMENT FOR AMERICAN MOTORS

CONSIDERING that it is usually taken for granted that a motor with small cylinders and capable of being operated at very high speed—giving its maximum power somewhere close to 3,000 revolutions per minute, for example—can be much lighter per horsepower than a motor designed to develop maximum power at 1,500 revolutions, an argument to the contrary of this assumption offered by *Engineering*, of London, in its issue of August 21 will be found of interest. The reasoning is expressly intended to account for the popular liking shown for American automobiles in Europe and to suggest that European builders would do well in going back to relatively slow-speed motors in lightweight car constructions. It runs substantially as follows:

Where the Weight Lies

In any comparison equal standards of durability must of course be assumed. It is first to be remembered that the weight of the cylinder barrels is not the most important item in the upright automobile motor. Valve seatings and boxings usually weigh more. Crankchamber, crankshaft and bearings make up a very large part of the total. The sizes of these parts depend upon the pressures and can therefore be made lightest where the pressures are smallest. The greatest weight-saving from reducing cylinder size is obtained in the aeroplane motors with cylinders radiating in one plane, because in these the number of cylinders is large while the weight of shaft and casing are relatively small.

Up to a certain point lightness is no doubt most readily secured by small cylinders and high speed, as the explosion pressures are reduced with the size of cylinders, but, even if these pressures alone are considered, the weight reduction is not in proportion to the increase in number of revolutions, because valves and valve gears must remain the same for a given power, whatever the speed, and the rubbing speed of journals is increased, so that their areas cannot be reduced in proportion with the load reduction. Moreover, the length of these bearings largely determines the length of crankshaft and casing.

At really high speeds—that is, beyond the limit within which a gain in lightness is after all secured—the question is complicated by the growth of the pressures due to inertia of the moving parts. These go up at the square of the speed and come to exceed the explosion pressures. They cannot be cushioned by a constant application of the power, as in high-speed steam engines. The crankshaft and other parts must be enlarged to take these stresses, and the bearings must be increased in area. As the rubbing speed is greater, the bearing pressures per square inch must be lower, and the area of bearings must therefore be increased at a ratio above the square of the speed; and there will be a point beyond which the increase in weight will be greater than the increase in horsepower.

The compression used also affects the results. In a high-speed motor high compression must be used in order to get the charge burned in the available time. And, while the mean pressure during the working stroke is not materially raised by a very high compression, the maximum explosion pressure is raised considerably and must be provided for.

Calculated Forces in Three Cases

The relative effects of the explosion and the inertia forces in three motors of the same power, but of different speeds and with cylinders of different sizes, are scheduled in Figs. 1, 2 and 3, in all of which A represents the shaft of a low-speed motor, B that of a medium-speed and C that of a high-speed motor. Different sets of stresses are represented by the inscribed figures, which have been calculated from the supposed data of the three motors. Motor B may be supposed to run at 1,500 revolutions, developing 40 horsepowers, and to have cylinders with 4-inch bore and 5-inch stroke. A and C are to produce the same power—A at 750 and C at 3,000 revolutions—and for convenience it may be assumed that they all have the same stroke. In this case A will have a bore of 5.66 inches and C one of 2.83 inches. The reciprocating parts of A, B and C may be taken to weigh 7, 3½ and 1¾ pounds, respectively, and the rotating parts are estimated at 6 pounds in all three cases, including the connecting-rod knuckle with bushings, 50 per cent., and the crankpin and portions of the cheeks the other 50 per cent. The explosion pressure can be assumed to be 300 pounds per square inch in every case. These supposed data come near enough to realities for purposes of comparison.

Fig. 1 gives the forces acting on the crankpins to produce bending stresses on the shaft and pressures on the main bearings. In the low-speed motor A the maximum force on the pin is 6,836 pounds, due to the explosion pressure. In B this is reduced to a maximum of 2,047 pounds, partly owing to the reduction of the piston area and partly to the increased inertia of the parts which act against the explosion pressure. But in C the maximum acting on the shaft is 5,242 pounds and is due to the inertia forces at the end of the exhaust stroke.

The size of shaft necessary for strength depends on these forces and the distance between main bearings, and the latter depends largely upon the required length of the connecting-rod bushings. The pressures upon these bushings—by which their length is dictated—are given in Fig. 2, where it is indicated that the crankpin pressure maximum is 6,957 pounds in A and is due to the explosion pressure, is 2,531 pounds in B, but rises to 3,306 pounds in the high-speed motor C by reason of the inertia forces. In considering the effects of the pressures it must be remembered that the areas should depend not only on maximum values but also on the mean or average values by which wear is largely determined. The inertia pressures are to be sustained at three out of four stroke reversals, so far as those due to the reciprocating parts are concerned, and all the time in the case of the centrifugal forces, while the explosion pressures occur only at the working strokes. The mean values are thus much higher in the C type.

It must also be remembered that in the C type the very fact of adding to the size of the knuckle and crankpin bearings, in order to meet the stresses, adds to the weight of the revolving parts and therefore to the centrifugal forces, and that a

larger area for the unit of load should be allowed in this type on account of the higher rubbing speed.

All considered, it is seen that the knuckle bearings will have to be very much longer in C than in B and probably quite as long as in A. To keep the stresses uniform, the shafts will have to be much in the same proportion. Owing to the extra weight of crankpins and knuckles, the actual pressures on the main bearings of C will be greater than shown by the figures. The middle bearing has to carry very heavy pressures at the bottom of the stroke of the two middle cylinders, the two end-bearings having corresponding upward pressures, and these conditions are reversed, of course, each half revolution. This explains the great length always given the middle shaft bearing in a motor of the C type with three bearings.

From all of these considerations it is at least evident that there is a very definite speed which will give the lightest motor. To ascertain what this speed is the conditions should be carefully studied and the probable weight of all parts determined with fair accuracy. Curves of the pressures and stresses could then be laid out which would give the desired information, but the best speed will, of course, always depend largely upon the general design of the motor and upon the standard of durability desired. It is noticed that successful builders of aeroplane motors, though the standard of durability for these is not high, keep revolutions below 1,500.

Throttled Running Emphasizes the Moral

In the argument, the effect of the flywheel has so far been ignored and the motors have been considered as running at full power only. It seems probable that in the case of single-cylinder motors for motor cycles high speed is necessary for lightness by reason of the need of keeping the flywheel size within bounds. With regard to motors for automobiles two fresh factors come into play. The fact that a wide range of motor speeds is required—in order to take hills on high gear—favors the high-speed motor, as a large flywheel is wanted to make a very large motor run slowly. On the other hand, the fact that the motor is mostly run throttled favors the slow-speed type, from the fact that explosion pressures are reduced while the inertia forces remain the same. In a car with a fair reserve power the motor usually works at perhaps a quarter of its possible power, and while the explosion pressure does not fall quite in proportion to the mean pressure, it is probably below 150 pounds per square inch most of the time in a 40-horsepower motor. Hence Fig. 3 shows the forces on the crankpin, and therefore those on the main bearings, at this pressure. In this case the maximum for A is 3,136 pounds, for B 1,653 pounds and for C 5,242 pounds. Further, the mean pressures for C are enormous, while in A they are very low. It is therefore probable that the A type, with a speed of 750 revolutions, could be built very nearly as light as the B type of 1,500 revolutions and a great deal lighter than the C type of 3,000 revolutions—durability even.

Conclusions

It is evident that motor speed should be as low as consistent with lightness, as all the practical advantages lie with the low-speed motor, particularly in the matters of maintenance, noise and price. Probably 1,500 revolutions should give the maximum power, which would mean that the motor in ordinary automobile practice would be run at about 1,000 revolutions, in order to have a reserve. This matter is of great importance, in view of the very great extension of the American motor car trade. Price is only one factor of their sales, the really important point being that their cars are light for their power and quiet; both these advantages coming largely from the use of moderate-speed motors.

Dimensions of Valve Control Organs in Automobile Motors—Calculations and Formulas

A SERIES of formulas for determining the dimensions of valve control organs in automobile motors is presented with brief reasoning by the German engineer, A. G. Von Loewe. Their value lies largely in the suitable choice of the factors which are considered as known and by which those sought are determined, this choice rendering it possible to apply the formulas directly to different designs of motors, independently, for example, of variations in the valve timing. The subject comes in several divisions; namely, (A) dimensions of intake channel, (B) dimensions of valve springs, (C) forms and sizes of cams, (D) adjustment of cams (valve-timing), (E) tappet rods and rollers and (F) camshafts.

In the following the notations used are boxed to facilitate the reading.

Notations

c = mean piston speed, in meters per second, m/sec.
v = mean gas velocity in suction channel, in m/sec.
d = cylinder bore, in centimeters, cm.
d_1 = diameter of suction channel, in cm.
f = sectional area of suction channel, in square centimeters, cm².
F = piston area, in cm².
d_2 = mushroom valve diameter, in cm.
d_3 = valve stem diameter, in cm.
l = valve stroke, in cm.

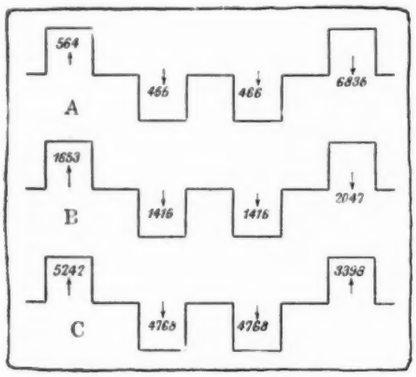


Fig. 1—Maximum forces producing bending stresses of crankshaft and pressures in shaft bearings

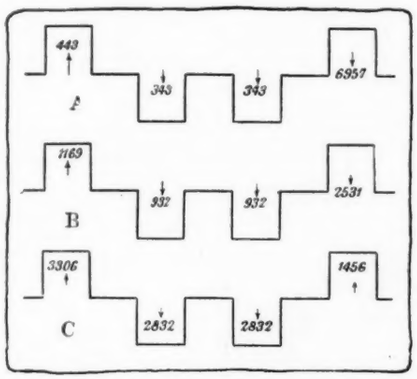


Fig. 2—Maximum stresses upon crankpins on bushings of connecting-rod knuckles

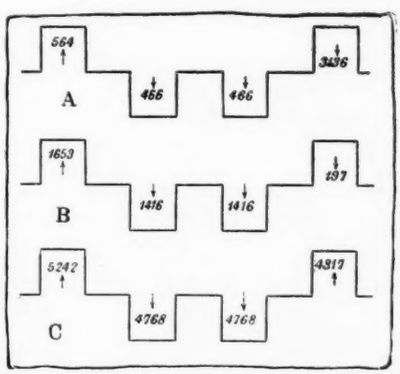


Fig. 3—Forces acting on crankshaft (as in Fig. 1) when motor is throttled to ¼ power, though running at full speed.

As f and F, and therefore also the squares of d_1 and d, must be inversely proportionate to v and c, one has

$$\frac{d_1^2}{d^2} = \frac{c}{v} \text{ or } d_1 = d\sqrt{\frac{c}{v}} \text{ and also } f = F\frac{c}{v}$$

Taking for v a gas velocity of 50 meters per second [which should be considered a minimum—ED.] the following values are obtained:

Sectional area of suction channel $= f = .02\ Fc$ and

Diameter of suction channel $= d_1 = .14\ d\sqrt{c}$ (1)

The stereometrical relations or the standard formulas on the subject give further:

Diameter of mushroom valve $= d_2 = 1.2\ d_1$ (2)

Diameter of valve stem $= d_3 = .1\ d_2 + .4$ cm. (3)

Valve stroke $= l = \frac{f}{\pi d_2} = .32\frac{f}{d^2}$ (4)

Valve Springs

The valve springs must be capable of resisting the depression occurring in the cylinder when the motor is operating with the throttle closed. This is a minimum requirement.

Notations

p_0 = pressure at beginning of suction stroke.
v_0 = volume of gas at beginning of suction stroke.
p = pressure at end of suction stroke.
v = volume at end of suction stroke.
p_1 = depression; P_1 = depression acting upon intake valve, in kilograms, kg.
e = volumetric compression; P = spring tension with valve closed, in kg.

One has $\frac{p}{p_0} = \frac{v_0}{v}$, as pressures and volumes are inversely proportionate; therefore $p = \frac{p_0\ v_0}{v}$, and as $p_0 = 1$ kg. per square centimeter and $\frac{v}{v_0} = e$, being the volumetric compression, then $p = \frac{1}{e}$. The depression $p_1 = 1 - p$ and therefore $p_1 = \left(1 - \frac{1}{e}\right) = \frac{e\text{-}1}{e}$, in kg/cm².

The force of the suction to be resisted is further specifically dependent on d_2, the diameter of the valve, and thus

$$P_1 = \frac{\pi d_2^2}{4} \cdot \frac{e\text{-}1}{e}, \text{ in kg.}$$

In practice this minimum should be exceeded, say doubled, in order to accelerate the closing of the valve with sufficient vim. Figuring with $e = 4.25$ [which stands for a high compression and a small combustion chamber if the opening of the intake valve is delayed 45 degrees, for example, beyond low dead center—ED.], the spring tension may therefore be calculated as

$$P = 2P_1 = \frac{\pi d_2^2}{2} \cdot \frac{3.25}{4.25} = 1.2\ d_2^2, \text{ in kg.} \quad (5)$$

Other Notations

P_2 = tension of entirely compressed spring, in kg.
P_3 = tension of spring when valve is entirely open, in kg.
L = length of spring with valve closed, in cm.
L_1 = length of entirely compressed spring, in cm.
L_2 = length of spring with valve entirely open, in cm.
L_3 = length of released spring, in cm.
f = deflection of spring by tension P, in cm.
f_2 = deflection of spring by tension P_2, in cm.
f_3 = deflection of spring by tension P_3, in cm.
d = diameter of the spring wire, in cm.
r = mean radius of spring coil, in cm.
i = number of fully effective coils of spring.
d_2 = diameter of valve; l = valve stroke.

To introduce a factor of safety against snapping of a spring, it may be assumed that the spring with the valve closed is deflected only one-half of its total stroke, this meaning that $f = .5\ f_2$ and $P_2 = 2P$.

The radius r is determined by constructive relations and may be taken as a known factor. We can thus apply to P, the standard formula for maximum pressure of a coil spring with round wire, so that

$$P_2 = \frac{\pi d^3}{16r} \cdot kd$$

in which kd is the admissible maximum torsional load, and if kg. is taken at 4,500 kg. per square centimeter, this being the accepted figure for hardened machinery steel of good grade, there is obtained for d, the diameter of the wire, the value

$$d = .13\sqrt[3]{P_2 r}, \text{ in cm.} \quad (6)$$

For f_2 the standard formula gives the value

$$f_2 = \frac{4\pi i r^3}{d} \cdot \frac{kd}{G}$$

in which G is the modulus of torsional elasticity. If the value of G is taken at 750,000 kg. per square centimeter, being the accepted figure for good hardened machinery steel as before, the formula for f_2 becomes

$$f_2 = .075\frac{ir^3}{d} \quad (7)$$

The derived values of interest are readily seen to be as follows:

$$f = .5\ f_2$$
$$L_1 = (i+1)d$$
$$L = L_1 + f$$
$$L_2 = L_1 + f_2$$

With the valve fully opened:

$$P_3 = P\left(\frac{l}{f} + 1\right)$$
$$L_3 = L_2 - (f + l)$$
$$f_3 = f + l$$

(To be continued)

Electro-Magnets for Scrap Removal

DETROIT, MICH., Sept. 2—A huge electric magnet that carries 3,000 pounds of steel as easily as the five-cent variety will pick up a needle, is one of the modern means of transportation to be seen at the plant of Dodge Bros. in Detroit.

Electro-magnet dumping scrap in Detroit

From the forge and stamping rooms a constant procession of scrap iron and steel emerges, and in order to remove this quickly, the magnet plan was adopted. The crane is operated by a man seated in the cage at the left, and travels on an overhead track 400 feet long, leading to a railway track.

Fifteen Makers Get War Premium

On March 31, 1913, Germany Had 825 Commercial Vehicles Subsidized for War Purposes

IN 1913 the German government had a law passed the Reichstag whereby motor vehicles could be purchased and premiums allowed for them if they came up to the specifications and requirements of the German war department. In other words, the army was allowed to supply itself with vehicles owned or operated by the industrial establishments in Germany and the owners were given a subvention and allowed a premium.

On March 31, 1913, it was 5 years since the law had been passed and on that date, according to the official records, there were 825 motor vehicles at the service of the army; that is, vehicles for which subventions had been paid and premiums allowed, while there were 400 more vehicles in the empire which came up to the military requirements and could be used. Thus only 1,225 automobiles suitable for military purposes, according to the army regulations, were owned in Germany in March, 1913.

825 Vehicles Accepted by the Army

The 825 vehicles accepted by the army were made by fifteen German manufacturers and 165 of them, or 20 per cent., were Daimlers or Mercedes-Daimlers. H. Bussing, probably the oldest exclusive commercial vehicle builder of Germany, was second on the list with a total of 137 or 16.6 per cent. The N. A. G. company of Berlin followed with 108 or 13 per cent., and Benz came fourth with 103 or 12.5 per cent. In the case of Benz it must be mentioned that it ought to be the Gaggenau company, which was purchased a few years ago by the Benz works. The exact number of vehicles secured by the army department each of the first 5 years on record is given in the accompanying table, while the second chart shows in which industrial enterprises or business the 825 vehicles had been used.

The subvention allowed by the government amounts to 3,000 marks, or $750, for an army truck with one or several trailers, and 1,800 marks, or $450, for an ordinary truck. This subvention is what might also be called the purchase price, but during the succeeding 4 years the owner receives as a premium 1,200 marks, or $300, annually in the case of an army train—truck with a trailer or several—and $200 annually for an ordinary truck.

Many Conditions to Fill

In order to be acceptable for military use the vehicle must fulfil many conditions, among which the following are the most important: The army train trucks, with two men aboard and their regular equipment and supplies of water, gasoline, oil, spare parts, must be able to carry a load of 4,000 kilos, or 8,800 pounds, and pull a trailer carrying a man and a load of not less than 2,000 kilos, or 4,400 pounds. Thus fully equipped, the army train must be able to climb grades of 1 in 7 and travel at an average speed of 16 kilometers, or 10 miles an hour. Trailers fully equipped must not weigh more than 2,500 kilos, or 5,500 pounds, and must carry a load of at least 2,000 kilos, or 4,400 pounds. Fully loaded, the weight of a trailer must not be over 7,500 kilos, or 16,500 pounds. Army vehicles must be fitted with rubber tires. As for those vehicles having no trailers, they must not weigh over 9,000 kilos—19,800 pounds—when loaded, and under no circumstances must the weight carried upon the rear axle be more than 6,000 kilos, or 13,200 pounds. The weight carried upon 1 centimeter or .393 inch width of the rim may not be over 150 kilos, or 330 pounds.

It has been proven by the army experts that 50 per cent. of the vehicles which have been used either by the war department or by their owners during the period of 5 years were found still in very good condition after those 5 years and that after 6 years 30 per cent. were still serviceable for army purposes.

Subsidized by German Government During 5 Years Ending March 31, 1913

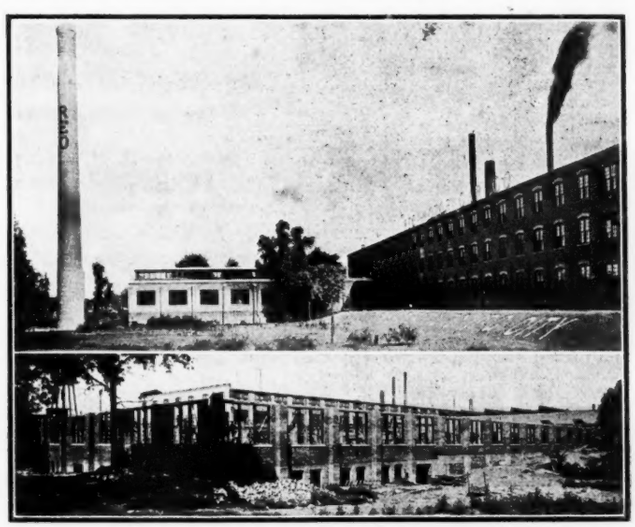
VEHICLE	MADE IN	1909	1910	1911	1912	1913	Total
Daimler	Marienfelde	61	46	19	23	16	165
Bussing	Braunschweig	50	29	20	22	16	137
N. A. G.	Berlin	25	27	19	21	16	108
Benz	Gaggenau	20	22	18	24	19	103
Mannesmann	Aachen	6	11	12	9	9	47
Mulag Durkopp	Bielefeld	..	12	9	9	9	39
Eisenach	Eisenach	..	11	9	7	9	36
Dixi Norddeutsche	Bremen	..	7	9	11	9	36
Lastwagen E. Nacke	Coswig-Saxony	..	10	9	6	5	30
P. H. Podeus	Wismar-i-M.	..	3	6	5	5	19
Stoewer	Stettin	4	7	6	..	..	17
Ehrhardt	Zella-i-Thur.	..	..	4	5	5	14
Deutsche	Dusseldorf	..	..	..	2	5	7
Last-Auto Ansbach	Ansbach	2	12	7	7	7	42
Joseph Rathgeber	Moosach-b-Munchen.	..	10	5	5	5	25
Fifteen manufacturers		175	207	152	156	135	825

Reo Adds $330,000 Equipment

LANSING, MICH., Sept. 7.—The Reo Motor Car Co., which last week declared a dividend of 15 per cent. in connection with a 10 per cent. dividend declared by the Reo Motor Truck Co., is adding $100,000 worth of buildings and $200,000 worth of new machinery. New boilers and coal and ash handling machinery will cost $30,000 more. One of the new buildings will be a three-story construction which will house the trim shop, top department, gear paint shop, and various assembly departments, and will add 4.5 acres of floorspace to the company's factories. Another smaller building is to be devoted exclusively to the methods of heat treatment devised and adopted by the Reo engineers.

Another addition in the shape of a building 95 by 600 feet is being made to the general machine shop which is expected to increase the efficiency of that part of the plant at least 50 per cent.

The 1914 production was double that of previous years and even the 25 acres of floorspace which the company now has at its disposal will probably soon have to be increased.



Two of the new buildings being added to the Reo plant at Lansing, Mich. The company is investing $100,000 in buildings and $200,000 in new machinery. The smokestack shown equals in cost the selling price of four Reo cars, or $4,800

New Books for the Engineer

Works Include Dictionary of Mechanical Movements and Harper's Gasoline Engine Book

ONE of the most interesting books, to those who like mechanics or want information on mechanical movements and devices, is the work by Gardner D. Hiscox, M.E., entitled Mechanical Movements, Powers and Devices. Harper's Gasoline Engine Book on the other hand is for the man who is anxious to learn the principles of motor car construction and operation. It is simply written in non-technical language. There are many other books of iterest.

MECHANICAL MOVEMENTS, POWERS AND DEVICES. Fourteenth edition. By Gardner D. Hiscox, M.E., the Norman W. Henley Publishing Co., 132 Nassau street, New York City. Cloth, 410 pages with 1,800 engravings, $2.50.

This edition is enlarged and improved in form. More than 160 up-to-date mechanical movements and devices have been added, including many straight line movements, thus making it a useful book of reference for those engaged in mechanical studies and pursuits, notably inventors and designers of machinery, in fact for all those who are interested in mechanics.

An enumeration of the subjects covered is impossible for reasons of space but it is sufficient to note that every conceivable mechanical device from valve movements to electric time clock transmission, is illustrated.

HARTNESS FLAT TURRET LATHE MANUAL, 1914. Published by Jones & Lamson Machine Co., Springfield, Vt.; 180 pages; cloth; liberally illustrated.

While this is published by a manufacturer of machine tools, it is in no sense a catalogue. It is intended as an aid to flat turret lathe operators in acquiring a true understanding of the machine and should be of value to anyone interested in machine tool work. Directions on speeds and feeds to use in doing different kinds of work are given and the operation of several types of turret lathes described.

HARPER'S GASOLINE ENGINE BOOK. By A. Hyatt Verrill, Harper & Bros., New York City, 293 pages with many engravings, cloth, $1 net.

The purpose of this book is to serve as a simple, practical, and complete guide for all those who own, use, or operate gas and gasoline motors. In its preparation every effort has been made to do away with technical terms and names and to adapt the book to the requirements of those who possess little or no knowledge of engineering or mechanics.

As far as possible all the principal and distinct types have been included and described as well as the more important or useful accessories, appliances, and fittings used in connection with motors.

In this book the marine, stationary, vehicle, and aeroplane motors have each been treated and described in separate chapters in addition to the clear and simple description of the principles, operation, and construction of motors in general.

The reader interested in some particular kind of motor can at once turn to the chapter dealing with this form without being obliged to read through the text relating to motors of other types.

Aside from the explanatory descriptions of the principles, operation, and construction of motors a great deal of space has been devoted to motor troubles and repairs. By its alphabetical arrangement this part of the book has been greatly simplified, and by referring to it almost any ordinary trouble may be located and remedied by an amateur.

The illustrations are nearly all original, the object being to furnish diagrammatic cuts which will clearly and simply accentuate the more important points described in the text.

PHYSICAL AND CHEMICAL PROPERTIES OF THE PETROLEUMS OF CALIFORNIA. By Irving C. Allen, Walter A. Jacobs, A. S. Crossfield, and R. R. Matthews. Published by the Bureau of Mines, Department of the Interior, 36 pages.

The pamphlet begins with an account of where the petroleum samples for analysis were obtained and a detailed description of how the samples were taken. Then the methods used in determining the physical properties are given, the specific gravity, flash point, burning point, viscosity, calorific value determinations being described in order. Then follows an account of the method used in fractionation, or separating each oil into its crude commercial components. At the end of the pamphlet several pages of tables giving the composition of various oil throughout the state are appended.

MASSACHUSETTS HIGHWAY COMMISSION. Twenty-first annual report for the fiscal year ending November 30, 1913. Wright & Potter Printing Co., 32 Derne street, Boston, Mass. Cloth, 220 pages.

This is a complete financial report of the money expended on the road for the year. The condition of the roads in various parts of the state before repairs were made is described and then the work done on them, and the manner in which it was accomplished, is told. There are chapters on maintenance and resurfacing, traffic and maintenance and suggestions are given for road legislation.

HARDENING, TEMPERING, ANNEALING AND FORGING OF STEEL. By Joseph V. Woodworth, the Norman W. Henley Publishing Co., 132 Nassau street, New York City. Cloth, 288 pages, 200 illustrations, $2.50.

A new work treating in a clear, concise manner all modern processes for the heating, annealing, forging, welding, hardening and tempering of steel, making it a book of great practical value to metal working mechanics in general, with special directions for the successful hardening and tempering of all steel tools used in the arts, including milling cutters, taps, thread dies, reamers, both solid and shell, hollow mills, punches and dies, and all kinds of sheet metal working tools, shear blades, saws, fine cutlery and metal cutting tools of all descriptions, as well as for all implements of steel both large and small. In this work the simplest and most satisfactory hardening and tempering processes are given.

The uses to which the leading brands of steel may be adapted are concisely presented, and their treatment for working under different conditions explained, also the special methods for the hardening and tempering of special brands.

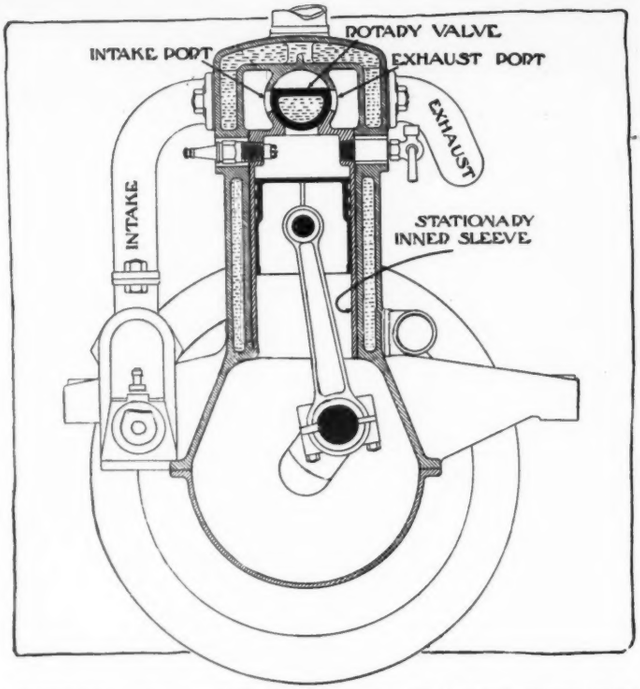
A chapter devoted to the different processes for case-hardening is also included, and special reference made to the adoption of machinery steel and tools of various kinds.

THE MOTORIST'S WORKSHOP. The Temple Press, London, E. C. 140 pages; cardboard; illustrated; 25 cents.

This is a handbook for amateur mechanics describing all essential operation in connection with metal working from the point of the motorist. The choice of a workshop is given consideration, and then materials and tools are discussed. Following this, are chapters on laying out work and drilling. Soldering, brazing and hardening are taken up and the operations described in detail. The remainder of the book, about half, describes the overhauling of the car.

WHO'S WHO IN THE AUTOMOBILE. 1914. J. R. Burton & Co., 1 Madison avenue, New York City. Paper, $2.

This book is an official directory of the state of New York containing the lists of permits issued, numerically arranged with the names and addresses of the owners and the names of the makes of the cars.



Transverse cross section through the Van Keuren rotary valve motor

New Rotary Valve Engine Is Simple Type

A NEW development of the rotary valve engine has been brought out by Henry P. Van Keuren, engineer in the Bureau of Highways, Philadelphia, Pa. There is a single rotary valve mounted directly over the top of the combustion space of the engine. This valve serves a dual purpose of intake and exhaust for all cylinders. It operates in conjunction with a common port in the center of the cylinder head. As shown in the illustrations, the valve is made of one piece, having a hollow center and extends the length of the engine. One of the odd features of this engine is the manner in which the rotary valve is kept sealed.

Extending downward into the cylinder casting, there is a sleeve which acts as the bearing surface for the piston and which has a cover acting as the bearing surface for the rotary valve. This sleeve is free to move in a vertical direction within the cylinder and although it remains practically stationary as far as the action of the engine is concerned, it acts as the means of sealing the valve port from the cylinder. The method in which this is accomplished is simply by the pressure of the gases within the combustion space. This pressure exerts itself equally on all parts of the combustion space and hence forces the sleeve tightly against the rotary valve.

No Valve Grinding

Of course, during the exhaust and intake strokes the pressure exerted by the inner sleeve against the valve is diminished and thus a virtual clearance is given between the valve and its housing. This permits the lubricating material to find its way along the surface of the sleeve oiling the working surface. The designer claims that during the life of the motor, the valve never requires grinding, as its wear is compensated for by the pressure of the sleeve against the valve.

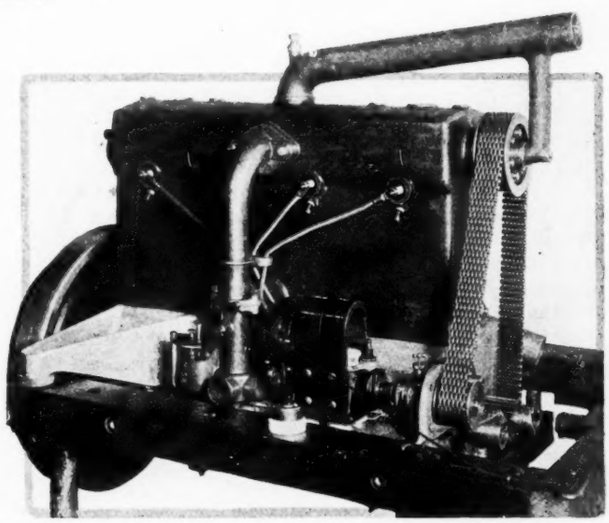
The valve is driven by a silent chain off the front end of the crankshaft. The same chain also drives the magneto. An idler pulley is inserted in the drive to maintain the correct adjustment on the chain. There is no sliding action in the entire valve mechanism of the motor, and its simplicity renders it of exceptional lightness. The rotary valve is driven at one-half the speed of the crankshaft and with the absence of reciprocating parts and spring returns in the valve action, a high rotary speed can be maintained with absolute precision in the valve action.

Oil Is Fed with Gasoline

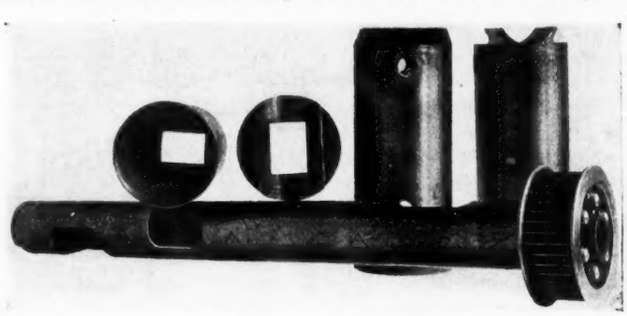
The size of the experimental motor is 4 by 4.75. It is lubricated by a splash system in the crankcase and the sleeve and other working parts are supplied with oil which is fed through the carbureter along with the gasoline.

In this motor the maximum port opening, or, in other words, the area of the common port is 17.6 per cent. of the piston area. While the inner sleeve is free, or rather a free sliding fit within the cylinder casting, there is no reciprocating motion of the sleeve. It remains constantly in contact with the valve itself. The makers of the engine at first supposed that the sleeve would drop from its uppermost position when the force of explosion in the cylinder had spent itself and the pressure of the gases dropped to atmospheric. Provision was made for this supposed motion of the sleeve in the form of an adjustable suspension by a set screw making contact with a shoulder or plug to which the priming cocks attached. This arrangement proved to be unnecessary.

The advantages claimed for the motor are silence and simplicity. On this particular design it is claimed that there are no small parts to be adjusted or inclosed. The line of simplicity is carried out to the cooling and lubrication systems in that a thermo-syphon system of circulation is employed with induced cooling through the center of the rotary valve. This valve is kept constantly full of water and since all parts of the valve are in contact with the cooling agent, the danger of unequal expansion and a cracking of the valve is eliminated.



Silent chain drive of the rotary valve at one-half crankshaft speed



Disassembled view of the valve mechanism of Van Keuren motor

Master Carbureter Has Multiple Jets

Rotary Throttle Shuts Off Jets for Varying Mixture

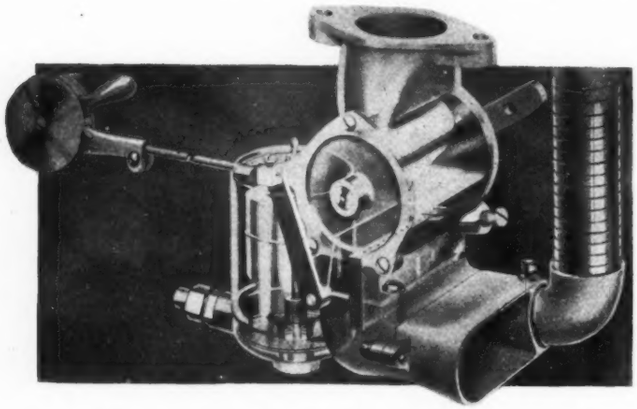


Fig. 1—Phantom view of Master carbureter made by Master Carbureter Corp., Los Angeles, Cal

THE Master Carbureter Corp., Los Angeles, Cal., which recently began manufacturing operations in Detroit in order to market its product in the heart of the automobile field, in addition to continuing its manufacturing for the Pacific Coast States in the California city, produces a simple type of mixing apparatus with no adjustments, which is perhaps not as well known to the eastern and mid-western automobile public as some of the carbureters which have been made in this section for some time.

Three Moving Parts

The Master carbureter, which is shown sectionally in Fig. 2, and a phantom view of which is seen in Fig. 1, differs from the conventional carbureter in that it has a rotary throttle and a multi-jet fuel distributer. These are seen at T and J in Fig. 2. There are three moving parts to the instrument, namely, the throttle, the air damper which serves to shut off a portion of the air coming through the air intake when it is desired to enrich the mixture, and the float. The flow of gasoline from the supply to the float chamber is controlled in the usual way by means of a metal float controlling the position of the needle valve with respect to its seat.

These carbureters are furnished in all sizes from 3-4 inch to 2 1-2-inch manifold connection.

In this carbureter both the fuel and the air are positively regulated, the amounts of each being apportioned mechanically by the rotary throttle. Fig. 3 shows the relation of the throttle to the multi-jet distributer. The throttle T is mounted horizontally on bearings and within the outer body of the carbureter and directly above the fuel distributer. It has openings in its upper and lower sides which are so shaped as to expose more and more of the jets along the length of the distributer as the throttle is rotated by the operation by the driver of the accelerator or the throttle lever. As the additional jets are exposed, more opening to the intake manifold is made, due to the upper aperture in the cylinder. Thus the amount of carbureter opening is in proportion to the jet opening.

When the throttle is fully open there are no restricted passages and the full gas charge is admitted to the combustion chamber, with minimum resistance, supplying all cylinders with equal quantities of gas. All the jets are then open.

To regulate the amount of air flowing up through the air passage and passing the series of jets, an air damper, extending entirely across the passageway and paralleling the fuel distributer, is provided. This is simply a rigid plate, rotating about its lower edge, and controlled from the dash. This damper is shown in Fig. 3 and also at D in Fig. 2. It may be regulated to restrict the air passage on its side of the jet as much as desired, shutting off entirely if desired. This gives a richer mixture for starting purposes, the most economical running position being when it is swung over against the side of the mixing chamber and giving free passage for the air. For ordinary normal running it should be set at about mid-open position, but, of course, this depends entirely upon atmospheric and other conditions.

Throttle Cannot Become Worn

Mechanically, the Master is well designed. The rotary throttle cannot become worn since it does not touch the throttle chamber in which it rotates. Neither does it come into actual contact with the distributer. It operates entirely upon the rather large journals at either end. As a precaution against dirt getting through and into the jets, a double filtering through screens of fine mesh is employed. One screen is below the intake needle valve at the bottom of the float chamber and the other screen, of tubular shape, is inserted in the float chamber and through it the fuel must pass before entering the multi-jet distributer.

As shown in the detail, Fig. 3, the fuel gets to the series of jets in the distributer through a main duct running horizontally along the lower part of the distributer. This connects with the passage to the float chamber.

Semi-Hot-Air Intake

The Master carbureter is, in standard form, fitted with a semi-hot-air intake. At one side of the part which connects through flexible tubing to a hot-air scoop fastened to the exhaust pipe is the opening to the air. It may also be fitted for all hot-air intake if the installation requires it.

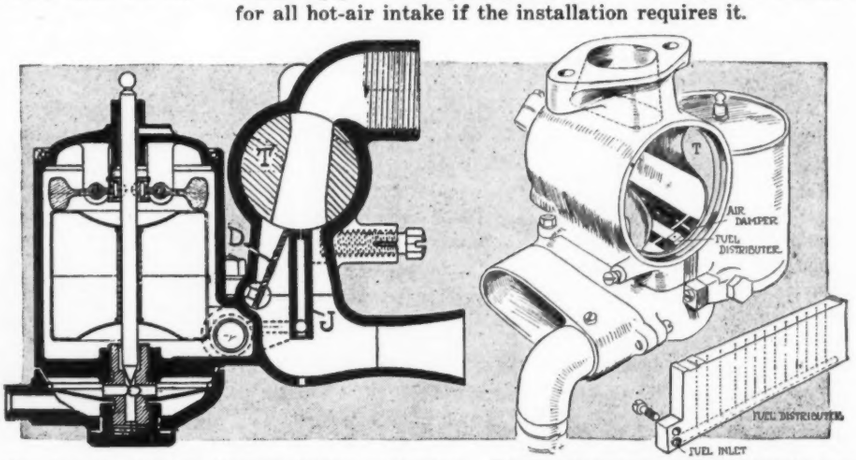
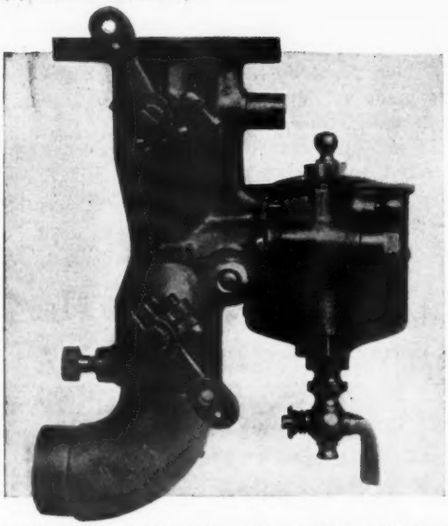
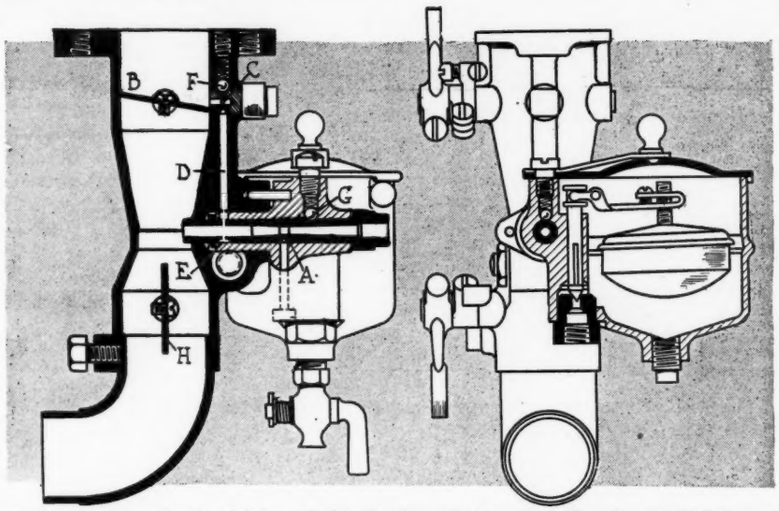


Fig. 2—Left—Section through Master carbureter. Right—Illustrating rotary throttle and location of multiple distributing jets. Fig. 3—Detail—Removable multiple jets





Left—Zephyr carbureter with vertical venturi. The nozzle tubes are plainly visible. Right—Section of carbureter showing nozzle tubes at the left and float mechanism at the right

Zephyr Carbureter Has Adjustable Jets

No Auxiliary Valves or Springs—Venturi May Be Horizontal or Vertical—Easy To Take Apart

SEVERAL notable features are found in the new Zephyr carbureter brought out by George A. Breeze, Detroit, Mich. No air valves, springs or weights are used, but perfect carburetion at all speeds is obtained, it is claimed, by the use of a low and high speed jet.

On open throttle the gasoline on flowing from the float chamber is sucked through the atomizer A, where the fuel is mixed with air flowing in through the jet tube as indicated by the arrow. The fuel is broken up and thoroughly atomized at this point so that when it mixes with the main column of air at the throat of the venturi tube a dry, homogeneous mixture is formed, it is stated.

When the throttle B is closed the mixture is greatly enriched by the major part of the atomized fuel, which is produced at A, being transmitted to the other side of the throttle butterfly by passing through the throttling jet C, which connects with the atomizing tube by means of the passage D and the orifices E. Thus a very rich mixture is delivered to the motor through the throttling jet and but a small amount of fuel passes out to the venturi where it is picked up by the small quantity of air flowing up past the throttle.

Adjustment by Changing Jets

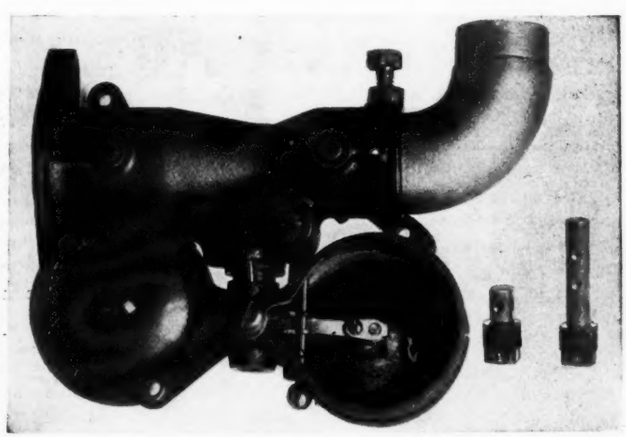
The adjustment of the carbureter is accomplished in a unique manner, the throttling tube C and the atomizing tube A are provided with four jets of different sizes placed at right angles to each other; only the bottom jet, however, is operative as it is the only one registering with the fuel passage. But any jet may be brought to this position as the tubes can be rotated, the outer end of each tube being squared to take a wrench. The tubes are normally held against rotation by means of the spring-engaged ball locks indicated by F and G. The jets in the atomizer are designated by the numbers 1, 2, 3, and 4, the latter being the largest, and the openings in the throttling jet are told by the letters A, B, C, and D. The throttling tubes are made in different sizes, the smallest jet in one tube being the same size as the largest jet in the next smallest tube. The difference in the variation of the throttling jets need not be so close as with the atomizer jets as they regulate mixture and not pure fuel. Easy starting is secured by closing the shutter H, which increases the suction on the jet.

A feature of the Zephyr is that the float feed mechanism can be inspected while the motor is in operation by removing the cover to the float chamber. This is done by merely rotating a small arm, which holds the cover in place. The three moving parts of the float mechanism can be instantly removed for inspection by pulling out the pin that carries the float arm. A line in the casting shows the proper fuel level. Removal of water or dirt is accomplished by opening the pet cock at the bottom of the float chamber. Complete inspection and thorough cleaning can be accomplished in less than 3 minutes, it is stated.

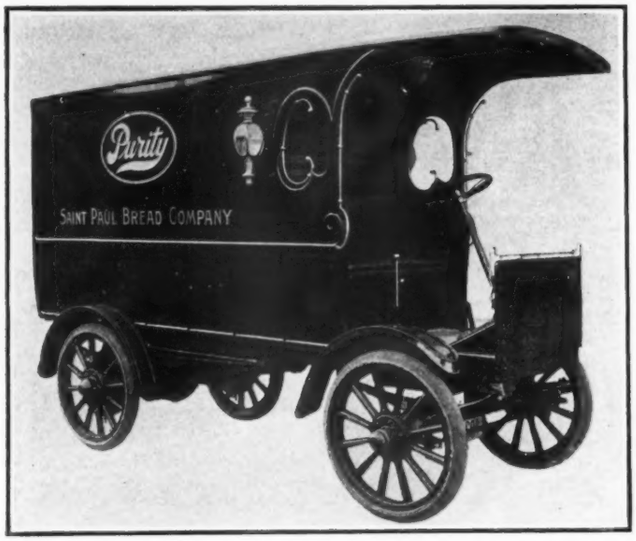
The atomizer gives a range of adjustment sufficient for all temperatures and grades of fuel but cannot be set so far out of adjustment that the engine will not run.

The Zephyr is so arranged that the venturi can be placed

(*Continued on page* 503)



Birdseye view of carbureter with venturi in horizontal position and float exposed. The low and high speed tubes are seen at the right



Purity Electric truck with two-speed sliding gearset

Purity Electric Truck Has Two Speeds

Made in Minneapolis, It is Designed for Snow and Sand—Motor, Sliding Gearset and Rear Axle in Unit—Has Worm Drive

A TWO-SPEED sliding gearset placed between the motor and the rear axle is the most notable feature incorporated in the Purity electric truck, built in capacities of 1 and 2 tons. These vehicles were especially designed to conform to the weather conditions of the Northwest, the lower gear being for the heavy snowfalls and sandy stretches of road which render the ordinary electric unsatisfactory.

The two-speed gearset is a unit with the electric motor and the rear axle, the latter being a floating design equipped with worm drive. The unit is carried on a triangular subframe which is attached to the axle at two points and pivoted to a cross-member of the frame at the apex, by a single globe joint.

These machines have been constructed by the St. Paul Bread Co., St. Paul, Minn. Although primarily intended for the use of the Purity company the shop equipment will enable it to accept outside orders. The designer is H. R. Kelly, formerly with the Studebaker Corp.

The frame is of pressed steel of uniform section, bottle-necked in front and braced rigidly. It is suspended from the Timken front axle and the worm-driven rear unit by four semi-elliptic springs. Both sets of brakes are on the rear wheels, and solid tires are employed.

The control is by a steering wheel on the left side, two pedals for the two sets of brakes, a lever in the center to operate the controller, and a lever to the left for the gearset. The dash carries the switch and Sangamo ampere-hour meter. The controller is located beneath the floor, and the electric horn directly beneath the battery box, bolted to a cross-member of the frame.

The battery trays are located under the driver's seat and a low box just behind it. Both brake and driving torque and propulsion are taken by the sub-frame which carries the motor and gearset, and are transmitted thereby directly to the middle cross-member of the frame, so that all portions share these stresses.

Both vehicles have 102-inch wheelbases, 36-inch Schwartz wheels, 40 by 2¼-inch front springs and 46 by 2¼ rears, both pairs being made of Vanadium steel, Westinghouse four-speed controllers and Ross steering gears.

Both are built for a 20 per cent. overload. The worm runs on Hess-Bright radial and thrust bearings, and the wheels on Timkens. The motors operate at 1,500 revolutions per minute at 35 amperes 70 volts.

Six-Ton Doane Truck Has Low Platform

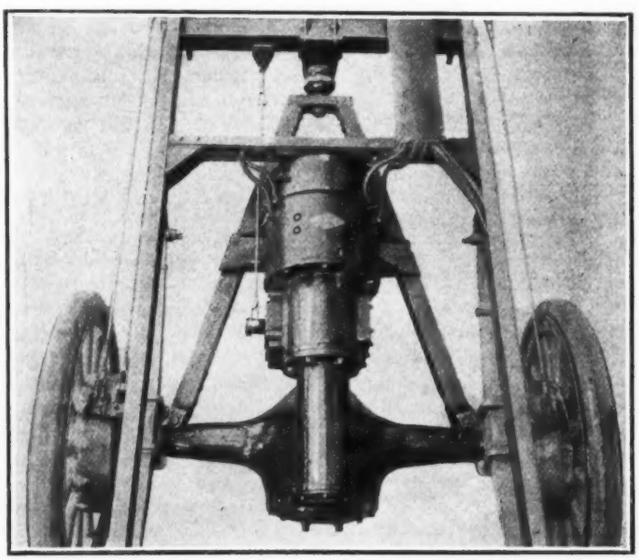
LOW-PLATFORM trucks especially designed for the hauling of heavy material, such as stone, machinery, structural steel, boilers and tanks, etc., are built by the Doane Motor Truck Co., San Francisco, Cal.

The frame is just high enough from the ground to provide sufficient clearance for ordinary conditions, thus permitting the platforms, built directly across the frame members, to be within easy lifting height from the ground. The frames are suspended by springs in the usual manner, clearance over the axles being obtained by deep drops in the axles and underslung springs. The drive is by double chains, the front sprocket centers being somewhat lower than the axle centers.

But one chassis model is made, this of 6 tons capacity. It has a total overall length of 20 feet 9 inches, and has a 14-foot loading platform. This platform overhangs the rear axle 4 feet, and without load it is 24 inches from the ground. Under load, the springs depress to bring it to within 22½ inches from the ground. The load distribution is 80 per cent. over the rear wheels and 20 per cent. on the front wheels.

The frame is of I-beam rolled stock with channel cross-members, made up rigidly, and, although horizontally straight throughout its entire length, it is bottle-necked in front to provide steerage-way for the front wheels.

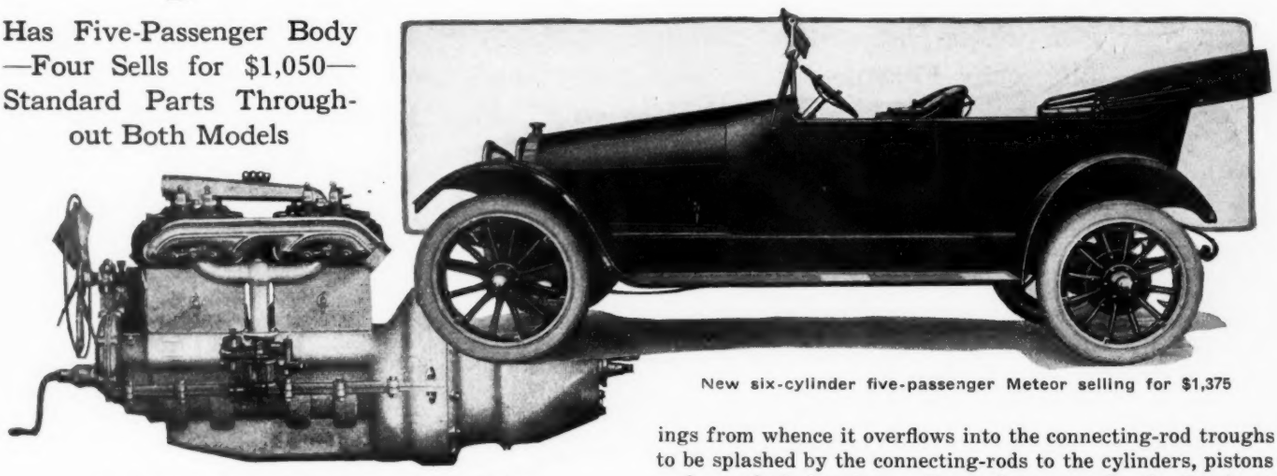
The front springs are shackled, but the rear springs bear on friction pads. The wheelbase is 14 feet 9 inches, with a 68-inch front tread and a 98-inch rear tread. Tires are 38 by 6 both front and rear, the rear tires being dual. The exceptionally wide tread in the rear gives a loading platform between the wheels of approximately standard width.



View of Purity rear construction showing the motor, and gearset in unit with the rear axle. Note triangular construction and worm drive

1915 Meteor Six Sells for $1,375

Has Five-Passenger Body —Four Sells for $1,050— Standard Parts Throughout Both Models



New six-cylinder five-passenger Meteor selling for $1,375

Unit power plant used in four-cylinder Meteor

THE feature of the Meteor line for 1915 will be a light six, rated at 45 horsepower and selling for $1,375. It is equipped with a five-passenger body and has a 126-inch wheelbase. Accompanying this model will be a light four, rated at 32 horsepower and listing at $1,050. Both have very full equipment, including an electric starting and lighting system. These cars are made by the Meteor Motor Car Company, Piqua, Ohio.

The only change of note in either of these models is a reduction in the bore of the four-cylinder motor from 4 inches to 3.75 inches, but as a higher speed motor is now used no reduction in power but rather a slight gain is claimed.

With this change the bore and stroke of both motors are the same, 3.75 by 5 inches, and all parts, except the crankcase, camshaft and crankshaft, are interchangeable. The motors are of Beaver make.

The general body lines of both cars are the same, the differences being due to variation in size of the two models. Several minor improvements are noted in these bodies. The running boards have been cleared and the body lines are more truly streamline than heretofore. To gain this end a sloping hood is used which forms an unbroken line with the cowl. A divided windshield of the clear vision type is fitted.

Left Drive Center Control

Left side drive with center control is found and all instruments are neatly mounted on the cowl. The finish of the body is dark blue with black fenders and hood. The metal parts are enameled black and trimmed in nickel. Deep turkish upholstery is employed and the top and dust cover are made of mohair. An electric headlight dimmer is a feature of the equipment, and an electric horn is fitted. The weight of the four is 2,350 pounds and the six weighs 2,950 pounds. The wheelbase of the former is 114 inches and the latter 126 inches. Thirty-two by 3.5-inch non-skid tires are standard equipment on the smaller car, while the larger one has 35 by 4-inch tires.

800 Miles Per Gallon of Oil

The L-head type of motor is found on both models, the cylinders being cast in pairs. This is in unit with the clutch and gearset and the whole is suspended on three points. The valves are inclosed and are situated on the left. The oiling system is a combination splash and pressure feed, a gear pump forcing the oil to each of the main bearings from whence it overflows into the connecting-rod troughs to be splashed by the connecting-rods to the cylinders, pistons and camshaft bearings. From these troughs the lubricant flows back to the reservoir, where it is again put into circulation by the pump. It is claimed that it is possible to go 800 miles on a gallon of oil under average conditions and that as high as 2,000 miles have been covered.

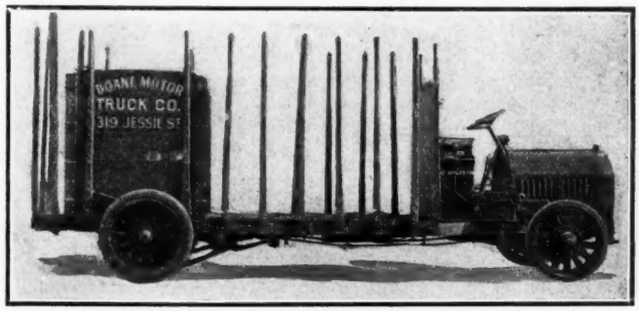
Ignition is supplied by an Atwater Kent system and the carbureter is a Stromberg. The Apple starting and lighting system is used. Cooling is maintained by a honeycomb radiator and a centrifugal water pump.

Clutch Is a Single Disk

The clutch is a single disk type, faced with Raybestos, and running in oil. A feature is the lightness, the whole rotating mass only weighing 8 pounds, therefore gear shifting is greatly facilitated. The clutch is housed in the flywheel, which in turn is inclosed in a bell-shaped extension of the crankcase. The gearset is bolted to this member. There is a hand hole in the top of the clutch case to enable inspection and adjustment. The clutch and gearset are manufactured by the B-T-K Gear and Engine Co. The universals are of Acme make and Salisbury axles are used at both front and rear. The springs are of Sheldon manufacture and Salisbury wheels are used. The bodies are from the factory of the Union City Body Co.

Seventeen New Indian Refining Stations

NEW YORK CITY, Sept. 4—By September 1 the Indian Refining Co., New York City, completed seventeen new stations. Indiana has the greatest number of them, there being seven recently completed in the "Hoosier" state. Illinois ranks second—there are five new stations in Illinois. New York and Minnesota have two each, while Kentucky has one.

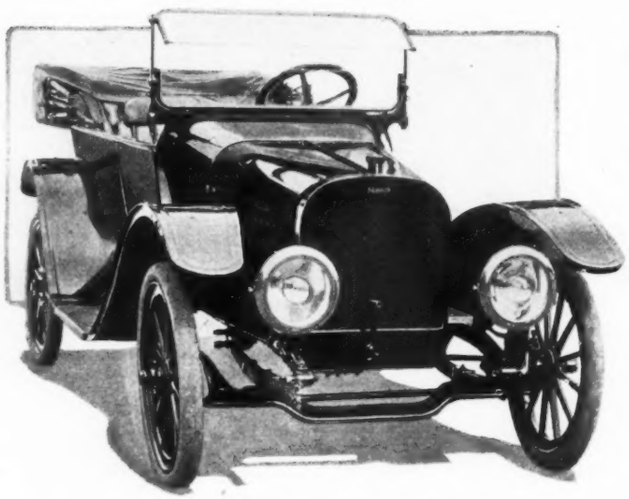


Six-ton Doane truck with low loading platform

Monarch Adds Light Four for $675

New Car Has Four-Passenger Streamline Body—One Folding Front Seat—No Rear Doors—20-Horsepower Block Motor—Electric Starter $25 Extra—Novel Fan Drive

THE Monarch Motor Car Co., Detroit, which has for its head R. C. Hupp, well-known in automobile circles of the motor car city, has added a four-cylinder light car to its line. This is a four-passenger machine of unique seating arrangement which has been priced at $675 with full equipment except electric cranking. The latter feature may be had also at an additional cost of $25.



Front view of streamline four-cylinder Monarch

Streamline Body

The body is a full streamline type and has creditable unbroken smoothness from front to rear. Outwardly it possesses somewhat the same appearance as its larger brothers of this make, though considerably smaller, of course. However, there is ample seating accommodation for four passengers.

There are no rear doors to the body, and the right front seat is made so that it will fold up and allow room for passage into the rear compartment. The left front seat which the driver occupies is stationary, however. This arrangement is rather unusual, but is nevertheless very meritorious in a small car.

Standard Construction Throughout

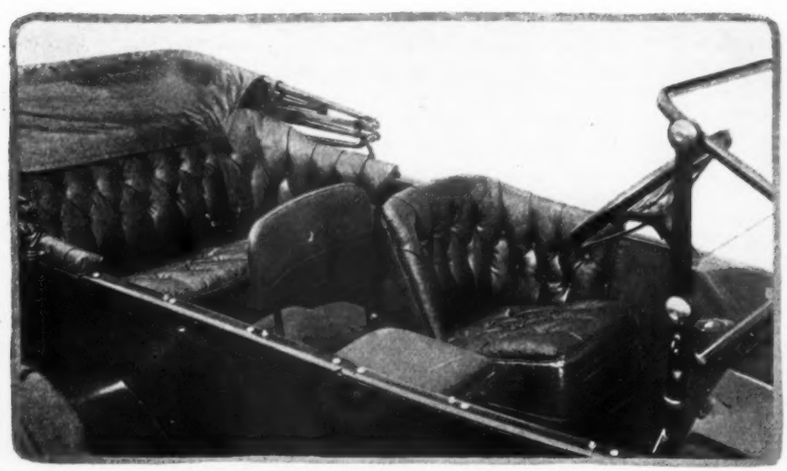
The wheelbase is 103 inches and with standard tread of 56 inches the car conforms to standard mechanical construction throughout the chassis. The motor is a thermo-syphon water-cooled block cast four of 2 3-4 inches bore and 4 1-2 inches stroke. These dimensions give it a horsepower of about 20 which is ample for the car weight—in the neighborhood of 1,300 pounds.

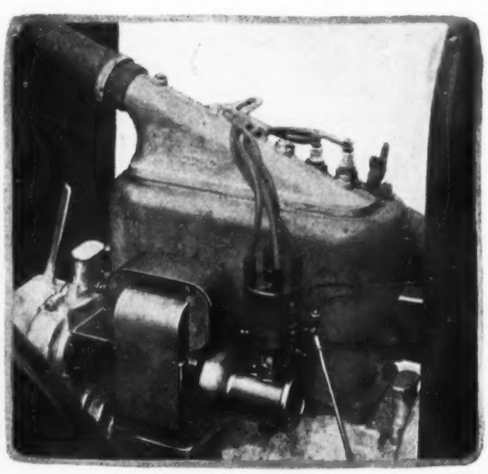
The power plant is of the unit type, incorporating the gearbox as a component part. The whole is three-point suspended, having the single support at the front end on a cross member and the rear two supports by means of a 1 1-4-inch steel tube running through the crankcase just ahead of the flywheel housing and ending in brackets on the side members of the frame. This gives a light and strong support.

The crankcase is of the barrel form and the cylinder block bolts to it. A plate at the bottom gives access to the connecting rods and bearings. Valves and manifolds are on the right side, and two cover plates inclose the tappets and springs, which are of conventional construction. Crankshaft and camshaft are of drop forged steel and each is supported by a large main bearing at either end. The timing gears are completely housed at the forward end.

New Type of Fan Drive

An uncommon feature in connection with the front gears is the drive of the fan. This is by inclosed gear also, the idler gear shaft being extended through the case, and on it the fan is mounted. This does away with any kind of external belt drive for the fan and, since there is no extra gear used for the fan drive, makes a very good construction without complication.

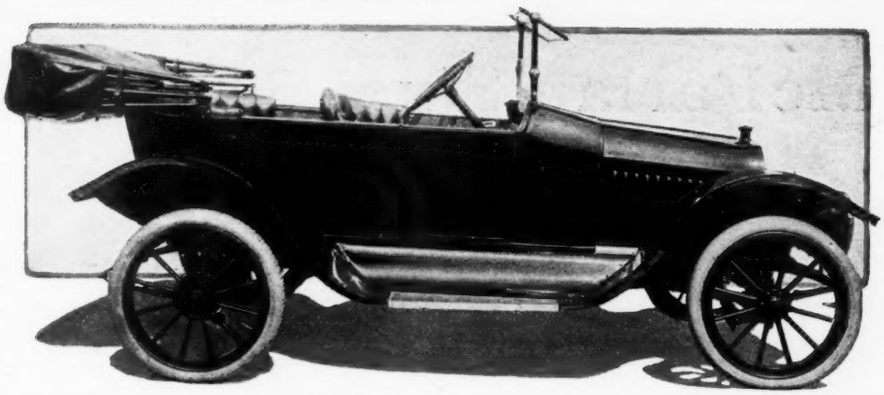




Left—Seating arrangement of new Monarch. Right front seat folds up, giving access to rear compartment, there being no rear doors. Left seat is stationary. Right—Block cast four-cylinder motor used on new Monarch. Note mounting of electrical system

The lubrication of the motor is of the splash type with the level in the troughs under the connecting-rods maintained by the automatic method, the air seal within the crankcase preventing more than the required amount of lubricant being drawn up from the reservoir and delivered to the troughs.

The carbureter, a float feed Zephyr make, is mounted high on the right side of the cylinder casting, having a very short intake pipe. There is only one opening into the casting, the distribution to the various cylinders being taken care of within the casting itself. The carbureter position is made possible, due to the placing of the gasoline tank in the cowl, assuring direct gravity feed. The tank has 8 gallons capacity with a 2-gallon reserve.



Side view of new four-cylinder Monarch light touring car. Note absence of rear doors, gasoline tank and cowl and streamline body

The Auto-Lite generator with which the new Monarch is regularly equipped is placed on a bracket on the left side of the engine and drives through gear at the front end. The ignition distributer is in unit with this generator and is of Connecticut make. Its current comes from the storage battery.

Ward Leonard Starter $25 Extra

The cranking motor is of the Ward-Leonard make, and is arranged to gear to the flywheel through a Bendix drive. That is, when the current is thrown on, the pinion automatically engages with the flywheel teeth, and as soon as the motor operates under its own power, automatically disengages again. The electric motor, which has a reduction of 15 to 1 as compared with the crankshaft speed, turns the latter about 130 revolutions a minute. The storage battery is a Willard. In instances where the car is ordered without the starting motor, it is pointed out that the engine is so arranged that this cranking feature may be added at any subsequent time since the battery is amply large to take care of the starter.

Three Speeds Forward

The gearbox, bolting to the flywheel housing, has three forward speeds and reverse and power comes to it from a multiple disk clutch within the flywheel. This has its disks alternately of steel and Raybestos lined. The drive shaft is open and has two universal joints. The drive is of the same form as used on the other Monarchs in that torsion members parallel the shaft on either side from a mid-cross member back to the axle housing.

Gearless Differential Used

The rear axle is light and strong. It is of the gearless differential type. That is, instead of having the usual spur differential gears within the bevel ring gear, there is a member of the gearless differential at either rear wheel. These members are fitted with a form of roller clutches which have the same action as the usual gears in allowing one wheel to turn faster than the other for rounding corners or under other circumstances. However, these roller clutches insure positive drive to both wheels in accordance with their traction. The gearless differential has been described on a number of occasions and has proven very successful in a number of installations on different cars.

Brakes are of conventional type and act on 8-inch drums. The wood wheels used are of twelve-spoke type and carry clincher rims on which 30 by 3 tires are mounted, the rear pair being safety treads.

Steer and Center Control

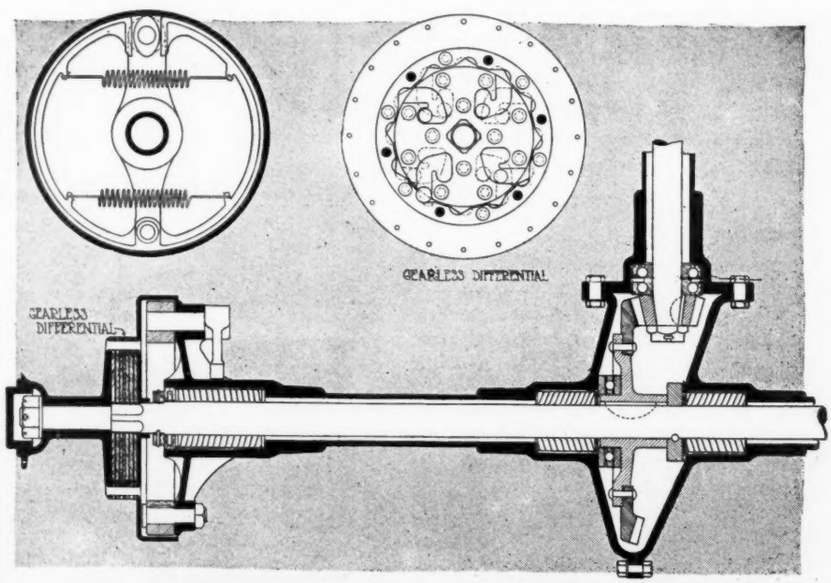
Steering is on the left and control in the center. There is nothing departing from the standard in the operation of the car. Even the usual quadrant above the wheel with spark and throttle levers is found.

The pressed steel frame is suspended by half elliptic springs in front and elliptics in the rear. These latter are swiveled on both axle and frame, and their free action tends to easy riding. The leaves are 1 1-2 inches wide, and lengths are 33 and 38 inches, front and rear, respectively.

Equipment in addition to that already mentioned includes one-man top and curtains, envelope, electric horn, rain vision windshield, Stewart speedometer, tools, repair kit, pump and jack.

International Races at Corona Thanksgiving Day

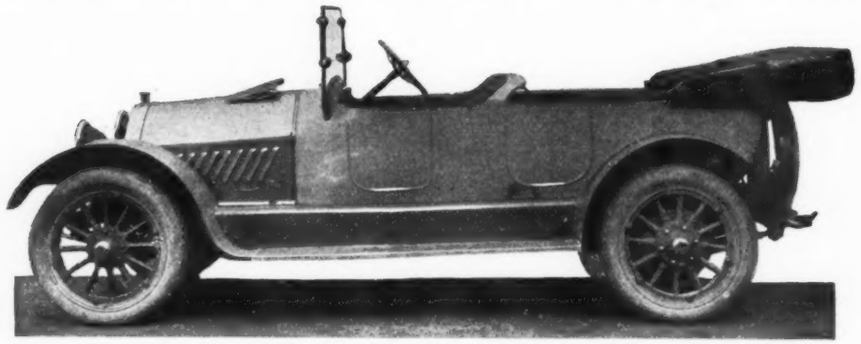
CORONA, CAL., Sept. 4—Definite plans were made recently for holding the international automobile races here on Thanksgiving Day. Purses amounting to $17,000 will be offered in the 250-mile and 30-mile races.



Section through the rear axle of the new Monarch light four, showing the gearless differential used. A member is located at the side of each rear wheel, each member consisting of a form of roller clutches which have the same action as the usual differential gears

McFarlan Sixes 300 Pounds Lighter

Two Motors—One Chassis—Wheelbase 4 Inches Longer —Stewart Gasoline Feed Adopted —New Arrangement of Control Levers



New McFarlan six with hood ventilator, and clean running boards

SEVERAL important changes have been made in the 1915 models manufactured by the McFarlan Motor Car Co., Connersville, Ind. As heretofore, two chassis will be built, or rather one chassis with two sizes of motors, the larger having a bore and stroke of 4.5 by 6 inches and the smaller, 4 by 6 inches. The former sells for $2,900 and the latter for $2,590, both equipped with open bodies.

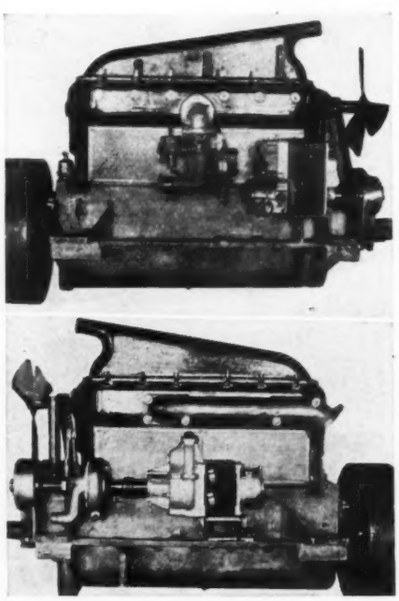
The most important changes which have been made include a lengthening of the wheelbase by 4 inches to 132 inches; a reduction of 300 pounds in weight; the adoption of the Stewart vacuum gasoline feed; a new arrangement of the gear shift and brake levers; the adoption of Westinghouse electric lighting and engine starting equipment; a new cone clutch; new body lines and a new tire carrier. As heretofore, equipment is complete.

In appearance, the new models will be quite a little different from their predecessors, the principal change being due to the lengthened wheelbase. The bodies are longer, as a matter of course, and now are set lower than heretofore. The upholstery does not project above the body lines at any point and the top line extends clear around practically without a break. Another distinctive feature is the addition of a miniature cowl at the back of the front seats. In addition to affording a measure of protection to those who occupy the tonneau, this cowl also serves a practical purpose in that it houses a small compartment suitable for goggles, gloves, etc. At the same time, the extra seats in the tonneau fold down beneath this compartment in such a way that no part of them projects into the doorway.

Few Mechanical Changes

Mechanically, not a great number of changes have been made, the more important ones being the adoption of the Westinghouse electric lighting, starting and ignition system and the substitution of a light cone clutch for the multiple disk member that has been used in the past. Although the Westinghouse apparatus now is standard equipment, the McFarlan pneumatic starter will be fitted where specified.

The two units of the Westinghouse system are mounted on opposite sides of the motor, the generator being on the intake side and the motor on the exhaust side; both are in accessible positions. The generator unit carries the distributer for the ignition system.



Two views of McFarlan six motor. Note high mounting of the carbureter

All of the wiring of the electric system has been thoroughly enclosed in flexible conduits; there is not an exposed wire on the car; these conduits are both dust and oil-proof.

The adoption of a cone clutch marks quite a departure from previous McFarlan practice and has been done with three objects in view: To simplify the chassis; to lighten the weight; and to provide greater holding surface.

The new member is a 16-inch leather-faced cone, the face being 4 inches wide. Beneath the leather there are twelve flat springs which are adjustable.

In the arrangement of the gear shift and emergency brake levers McFarlan engineers have solved a problem that long has existed. The placing of these two levers in the center of the foot board has not been easy because one is likely to interfere with the other. In the McFarlan arrangement, however, there can be no interference.

The gear shift lever is placed directly between the front seats and does not extend above them. Thus, it can never be in the way. The brake lever is quite separate and is set well forward where it, too, is out of the way though it is instantly available.

Although the weight of the car has been reduced by as much as 300 pounds, this has not been done by sacrificing the factor of safety. The chassis has been practically unchanged. Instead, the improved body construction throws part of the strain upon the metal parts of the framework, with the result that bodies now are much lighter than heretofore.

Another little change in construction, designed for the convenience of the owner, is the adoption of a new style tire carrier. As heretofore, the spare tires are carried at the rear of the body but instead of being held by four straps which must be loosened, but one is used.

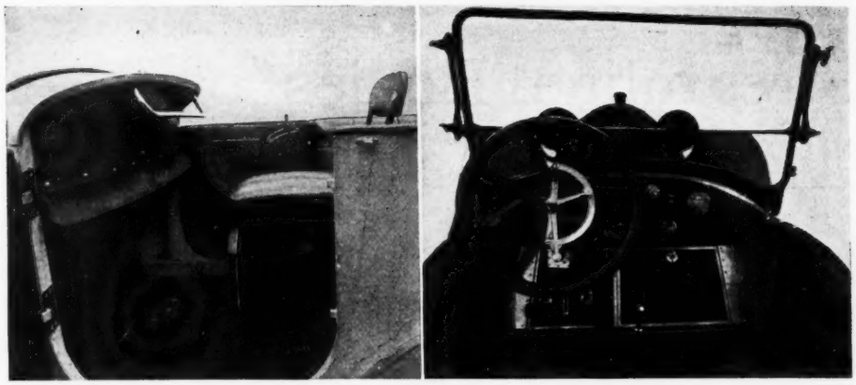
The two motors differ only in size. The cylinders are T-head block castings. The intake is on the right and the exhaust on the left. The intake manifold is noticeable in that it is nothing more than a short L-shaped fitting that connects with the carbureter and the cored passage in the cylinder casting. Thus the position of the carbureter is high and accessible. The exhaust manifold is separate from the casting. Water circulation is by a centrifugal pump situated on the left and the system is distinguished by the large size of the water manifolds.

The gearset is located on the back axle, the latter being a full-floating design. The drive shaft is housed in a torque tube which is reinforced by triangular rods running to the ends of the axle housing. Access to both gearset and rear axle is obtained by the removal of cover plates.

The tires are 36 by 4.5 inches all around and the frame is suspended on half-elliptics in front and three-quarter elliptics in the rear. The frame is heavily reinforced at the corners with gusset plates and is slightly narrowed in front to give increased steering radius.

The equipment is complete, including not only the usual top, curtains, and windshield, but also Hartford shock absorbers, Warner speedometer, power tire pump, headlight dimmer, cigar lighter, Klaxon horn, detachable rims, tools, etc.

Three body colors are offered, blue black, emerald green, and golden brown. Four different bodies are placed on each chassis, the prices being as follows for the smaller and larger cars respectively: Touring car and roadster, $2,590 and $2,900; 4-passenger coupe, $3,300 and $3,610; limousine, $4,000 and $4,310.



Left—Tonneau, showing compartment into which auxiliary seats fold. Right—View of cowl and control showing the arrangement of the levers—the brake lever is set forward out of the way and the ball-handled gear lever is placed between the seats

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Zephyr Carbureter Has Adjustable Jets

(*Continued from page* 497)

horizontally or vertically, as is desired. The air intake fitting can be put at any angle also.

The adjustment of the carbureter is simply accomplished by setting the atomizer and throttling jet tubes so that the nozzles A and C, respectively, are in operation. Then regulate the throttle stop screw until the motor idles as low as desired.

If the motor misses or stops, provided that the trouble is not mechanical or electrical and there are no air leaks in the manifold connections, the jet is too small. But if the motor misses and loads up, the jet is too large.

After the motor is warmed up, try driving with larger and smaller jets in the atomizer and use the adjustment found to be best.

When no setting makes any apparent difference in this, look for manifold leaks, spark plug or magneto trouble.

A steering column control of the starting shutter is furnished when desired.

Farmers Own One-Third of Wisconsin's Cars

MILWAUKEE, WIS., Sept. 7—Thirty-six per cent. of the 50,000 odd motor cars owned in Wisconsin belong to farmers, while 64 per cent. are in the hands of persons living within the limits of incorporated cities and villages, according to a compilation made by Ex-Gov. W. D. Hoard, editor of *Hoard's Dairyman*, Fort Atkinson, Wis. The basis of the calculation is the schedule of assessors in forty-one counties in Wisconsin which are considered agricultural districts, and does not include Milwaukee county because of the preponderance of city population over rural population, which is in the ratio of 97 to 3. Governor Hoard's figures show that one city family in every twelve and one farm family in every twenty-two owns a motor car. In Milwaukee county the ratio is 1 to 16 city families and 1 to 15 farm families. The richest farm county from the standpoint of number of cars is Walworth, in which one farmer in every nine owns a machine. The number of machines has a close relation to farm values. In Walworth county, for instance, farms have an average value of $13,000, while in a northern county like Shawano, where there is one machine to each thirty-seven farms, the average farm value is $6,000.

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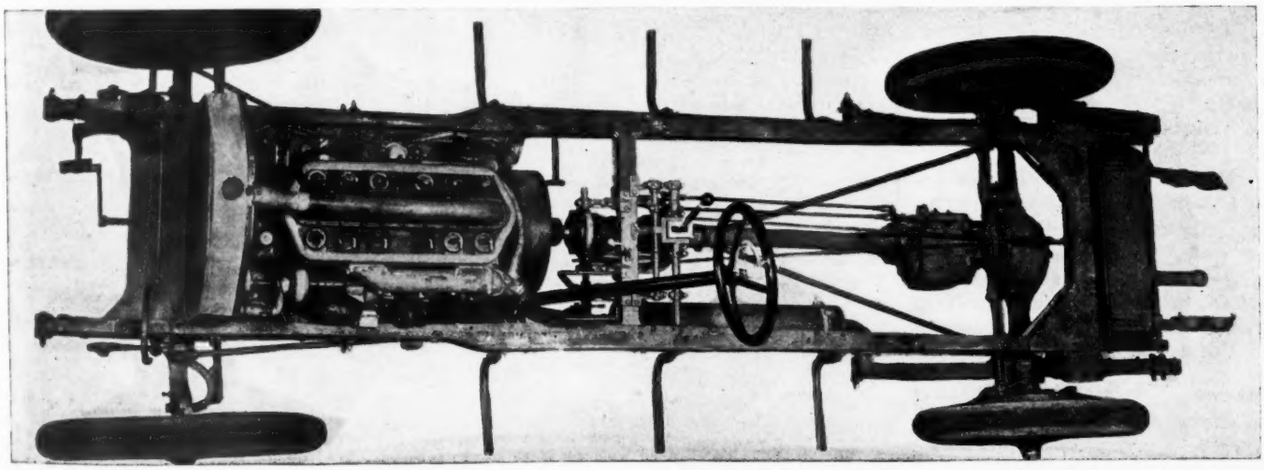
WASHINGTON, PA., Sept. 7—The plant of the Croxton Motor Car Co. has been sold to the Angldile Computing Scales Co., Elkhart, Ind., for $52,500. The new company, as soon as possible, will remove its equipment here.



Plan view of the chassis showing the general arrangement of the units. The frame is narrowed at the front and the corners gusseted

Streamline Bodies on Premier-Weidely

Six-Cylinder Weidely Type Unit Power Plant Continued Practically Unchanged—Three Bodies

Three-quarter front view of 1915 five-passenger Premier-Weidely six

FOLLOWING practically the same design as for the 1914 season, the 1915 Premier-Weidely has been continued with a few detail changes. This motor which made its appearance in December, 1913, excited immediate comment because of the fact that it employed the advantageous valve-in-the-head design and at the same time eliminated the rocker-arms and push-rods which are generally incorporated with this type of valve action.

Unit Power Plant Is Simple

For this season the Premier-Weidely will be made in five- and seven-passenger touring models and a roadster design of body. The price on all three styles is $2,700. While the bodies employed are the latest type in design and equipment, it is in the power plant that chief interest centers in this car. The motor has six cylinders, cast in a single block with a bore of 3.625 and a stroke of 5.5 inches. The valves are all located in the head and are driven by an overhead camshaft. They are without cages and are operated by the single camshaft which is located above the cylinders and which is driven directly from the crankshaft by a vertical shaft and a worm gear. The entire cylinder head is a single unit as well as the cylinders proper. This cylinder head carries the valves and the camshaft and is provided with an additional cover plate which forms an oil-tight housing for the valve mechanism. By this scheme of completely inclosing the valve action, the entire drive can be copiously lubricated and, in fact, runs in a bath of oil.

A glance at the exterior portion of the motor shows it to be of remarkably clean lines. Even the water pipes have been eliminated and the radiator bolted directly to the motor, making the two units an integral part. The intake manifold is cast in a unit with the cylinders and the carbureter bolts directly against this unit manifold, giving it an extremely high and accessible position. This method of construction makes a motor of very simple and clean appearance.

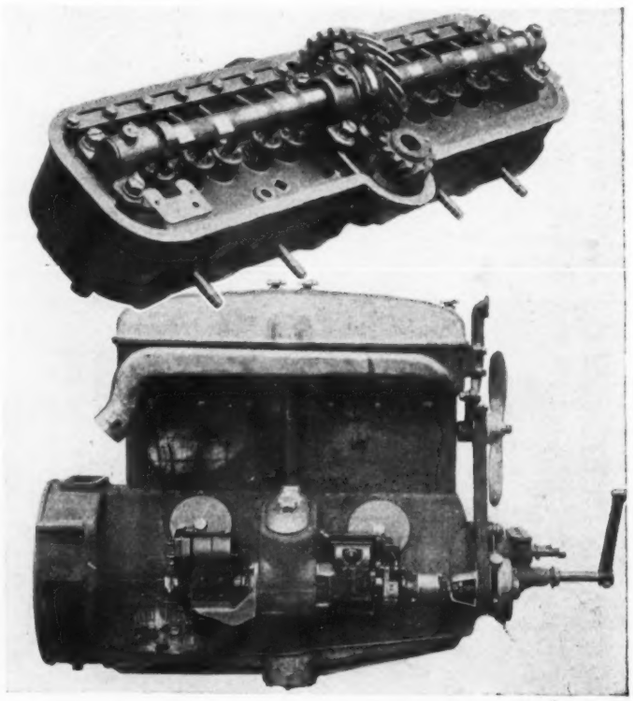
Overhead Valves of Large Diameter

Considering their location in the head, the valves are of large size, having an outside diameter of 1 15-16 inches and a diameter in the clear of 1 21-32 inches. The valves seat directly in the head casting and each valve overhangs the cylinder bore slightly so that in the event of a stem breaking, the valve could not fall into the cylinder. There are no rocker arms used. The camshaft is directly above the valve and the cams act on a light steel follower pivoted at one end. This finger lever transmits the motion of the cam directly to the valve. There is an adjustment by means of a nut on the follower which permits of taking of the wear on the valve mechanism. This corresponds directly to the usual valve stem adjustment.

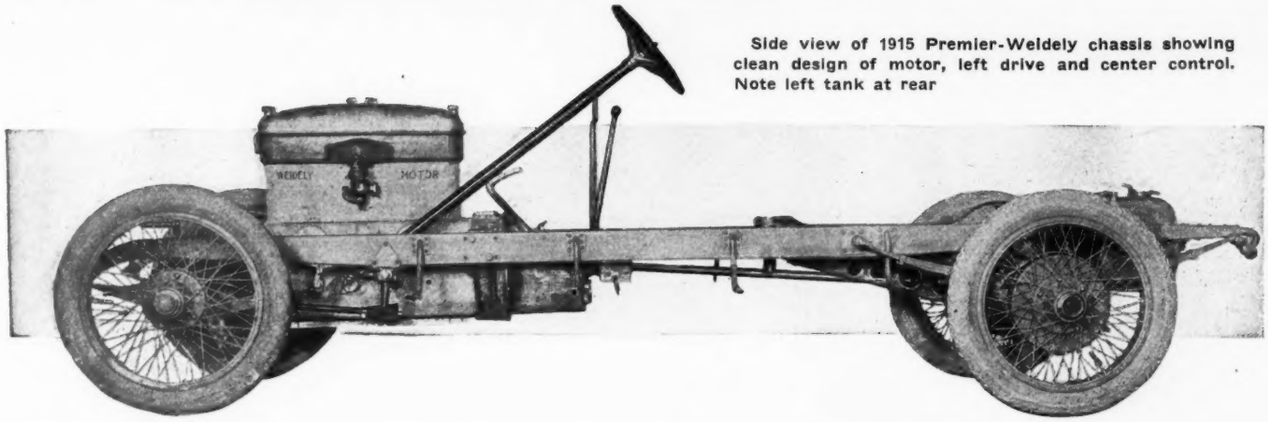
Valve Mechanism Is Unusually Light

The lightness of this valve mechanism is its special feature. By this construction it has been possible to make the valve springs 20 pounds weaker than in the ordinary type of engine. Another advantage gained by the light construction is the noiselessness of operation. To further increase the factor of silence, the complete oil-tight housing and the bath of lubricant also play their respective parts.

The vertical shaft by means of which the drive is taken from the crankshaft to the overhead camshaft is located at the longitudinal center of the engine. This position of the half-time gear gives it a balance which it would not possess if located at one end of the motor. Side thrust is also eliminated by the use of the pivoted finger which transmits the drive from the cam to the valve.



Weidely type of motor used in Premier cars. Above—Detachable cylinder head, showing operation of the overhead valves by a single camshaft driven by gear from the vertical shaft shown at the side of the motor



Side view of 1915 Premier-Weidely chassis showing clean design of motor, left drive and center control. Note left tank at rear

The Weidely motor is distinguished by the cross-head type of piston. This design is so arranged that the part taking the pressure of the gas is separate from that which acts as a guide. As will be seen in the cross sectional view, the piston-head and rings are formed as usual, but there is a slot .25 inch wide between the head and skirt of the piston. The piston boss is connected to the head by means of two crescent-shaped webs. By this arrangement, little or no heat can be transmitted from the head of the piston to the skirt and the head proper is kept cooler. With this piston a clearance of but .0015 inch can be used.

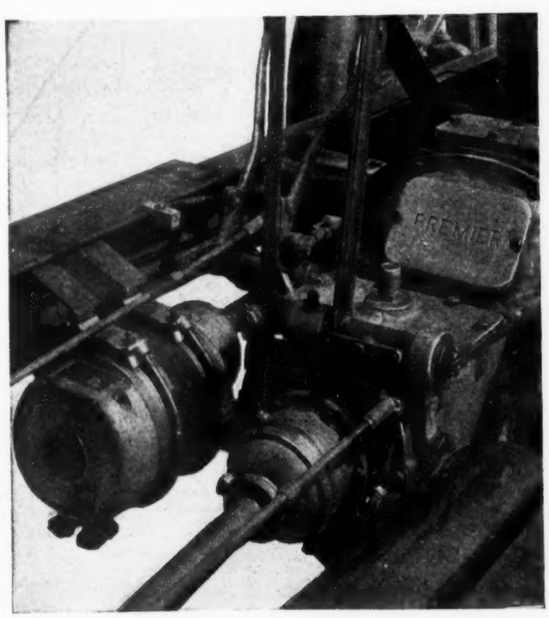
Four-Bearing Crankshaft

The crankshaft is carried on four bearings, the two middle bearings being between the third and fourth cylinders. All the main bearings are 2 inches in diameter, the length being 2 9-16 for the front, 1 5-8 for the center ones, and 3 3-4 for the rear. Connecting-rod bearings are 2 inches in diameter and 1 3-4 inches in length. The gear in driving the vertical shaft is fastened on a flange formed integrally with the crankshaft. The two central main bearings support the crankshaft on either side of this driving gear. The running thrust on the vertical driveshaft is taken by a Timken taper roller bearing.

The camshaft bearings are all solid bushings. There are four of these bearings, supporting the 1 3-16 inch shaft. The end bearings are 1 1-4 inches in diameter and 1 3-4 inches long. The center ones which are mounted on either side of the driving gear are 1 3-4 inches in diameter by 1 5-8 inches in length. A hole 3-8 inch in diameter is drilled throughout the entire camshaft and carries oil to the cams and end bearings.

All Drives Balanced

As for last season the Premier car of 1915 will be fitted with Remy starting and lighting and Eisemann magneto ignition. Following the system of balancing all drives throughout the car, the electric generator for the starting and lighting system is mounted on one side of the vertical shaft which drives the valve mechanism, while the Eisemann magneto is mounted on the other side. On this same shaft, which runs parallel to the crankshaft of the motor, the fan belt pulley is mounted.



Mounting of Remy starting motor on left frame member alongside gearbox. Note center control

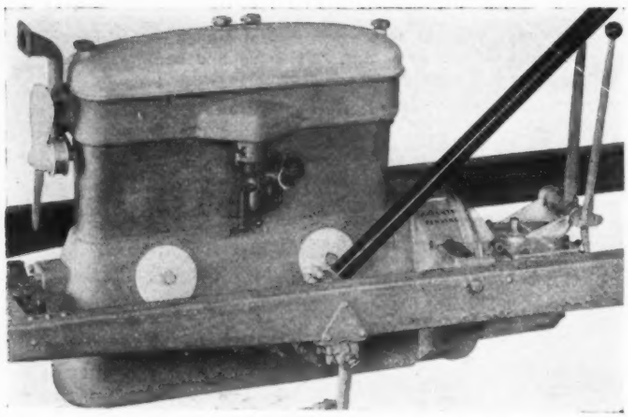
The oiling system of the new motor is a combination of pressure and splash, the oil being circulated by a gear pump bolted to the crankcase and driven from the bottom of the vertical shaft. The oil is distributed by a rotating sleeve on the top of the pump. Equal parts of the oil are sent to each of the six troughs into which the connecting-rods dip through a passage cored in the bottom plate. One part of the oil is carried to the valve mechanism. The camshaft bearing and cams are lubricated by means of the hollow camshaft above mentioned. The entire valve mechanism is bathed with oil by streams that issue from the backs of the cams. The oil is then drained toward the center of the cylinder head and falls back to the crankcase through a hole in the casting. In the center of the cylinder head casting is a well in which the camshaft gear revolves. The oil from the camshaft bearing keeps this filled so that as the gear revolves it is constantly oiled.

Superfluous Parts Eliminated

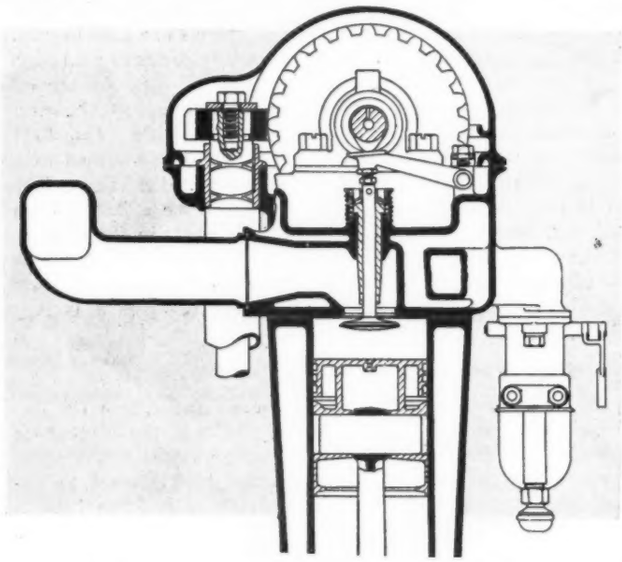
On the way to the crankshaft the oil falls from the top of the motor, strikes the gear in the middle of the crankshaft and also fills the two middle main bearings next to the gear. Troughs on the side of the crankcase lead the oil to the end crankshaft bearing. Leakage at these end bearings is prevented by an oil thrower ring which clears the shaft of lubricant by centrifugal force, sending the oil by a drain back to the main pump, whence it is re-circulated.

One of the striking features of the motor is the elimination of a number of parts by making one member discharge a number of distinct functions. An instance of this is the water pump housing which also serves the purpose of the connecting medium of the radiator to the pump, the pump to the motor, the starting crank bearing support, the radiator support, front motor support and holds the adjustable thrust bearing at the forward extremity of the crankshaft.

The upper water connection has likewise a variety of functions to fulfill. This casting, beside taking care of the water circulation, has a downward projection which supports the fan and provides an adjustment for the fan belt tension. The radiator is supported only by the top and bottom water connections and there is no



Illustrating the clean design of the Premier-Weidely unit power plant. Note the detachable cylinder head and also the high mounting of the carbureter, which is attached directly to the cylinder casting



Cross section through Premier-Weidely cylinder head, showing overhead valves operated by a single camshaft driven by the vertical shaft at the left

rubber hose. The radiator thus has a two-point suspension and is a solid unit with the motor. In fact, the unit idea is carried throughout the entire design of the power plant. It not only incorporates the motor, clutch and gearset but takes in the radiator as well.

22 Miles Per Gallon of Fuel

One of the claims of the Premier company is efficiency for this new type of motor. They state that by the elimination of about 40 per cent. of the moving parts, the motor has been silenced to a large degree and the efficiency increased to a marked extent. It is claimed that the number of miles per gallon secured with this type of motor is in excess of that generally obtained with a six-cylinder car. On a test held through the city streets on a touring model, when the motor was first brought out, an average of 22 miles per gallon was secured, showing the economy possibilities.

Outside of the engine, the Premier-Weidely does not differ greatly from the other Premier designs which have been previously described in these pages. The multiple-disk clutch is continued and the gearset employed has three-speeds with the control lever in the center in combination with left drive. The remainder of the chassis is exactly like the poppet design Premier with the exception that the rear springs are one-half elliptic instead of three-quarters. This has been done to reduce the side sway. The frame has a slight kick-up over the rear axle and is tapered, being 6 inches narrower at the forward end than at the rear to provide a narrow turning radius.

Three Streamline Bodies

The three body designs which are fitted on the standard cars are of streamline design and this, coupled with the V-radiator, gives the car a distinct appearance. The fenders are crowned and the fuel tank is located at the rear, pressure feed being necessary with the high carbureter. The hood is sloping and, being exceedingly short for a six, permits the designer to use the 132-inch wheelbase to advantage in securing space in the body. The tires are 36 by 4.5 inches, the spare being carried in the rear on a support rigidly connected to the side members of the chassis frame.

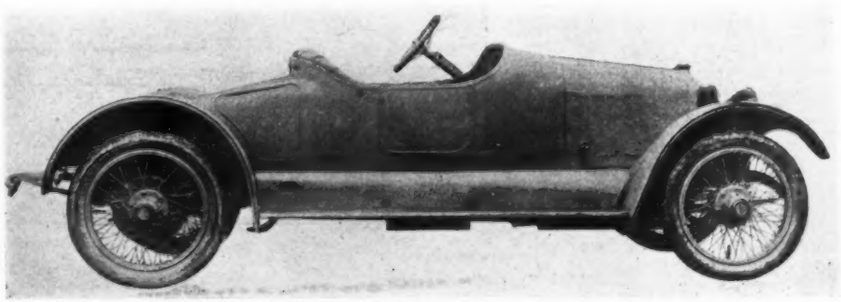
Overland Factories Rushed—Willys Optimistic

NEW YORK CITY, Sept. 8—Since returning from the war zone, John N. Willys, president of the Willys-Overland Co., has been making conservative estimates of automobile business in America and states that the Willys company is working its entire force all of the time and on a full-pay schedule. The company has 1,000 more unfilled orders than were on its books at this time a year ago, this in spite of the fact that daily shipments are fifty more cars than last year. On September 3 the company had shipped twice as many 1915 cars as it had shipped 1914 models a year ago.

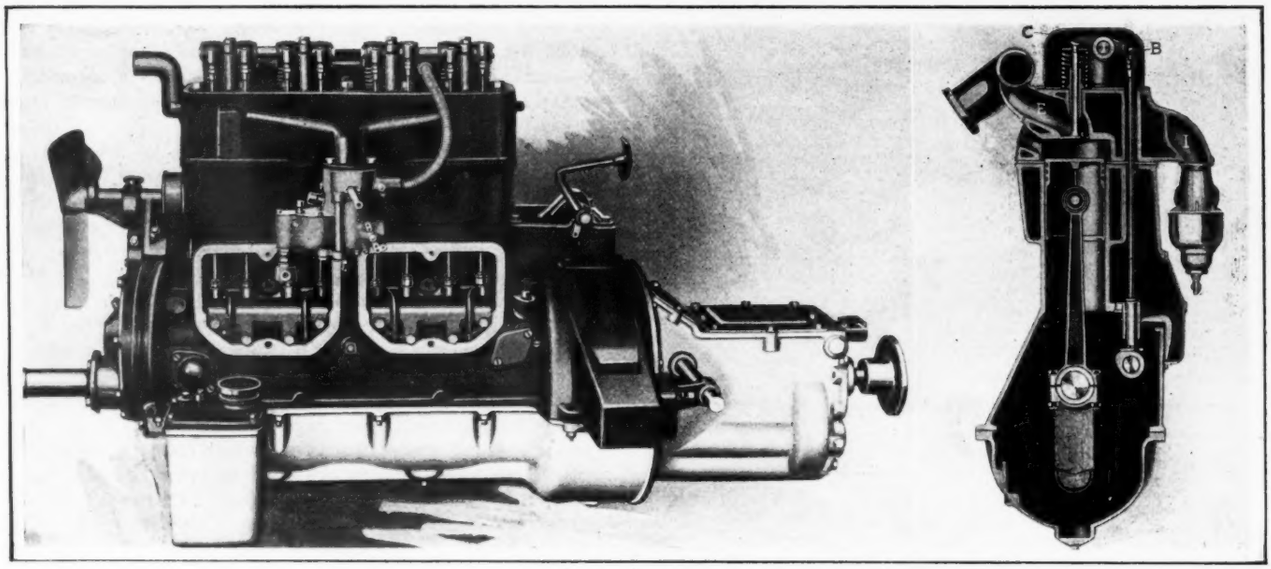
In looking over the country the retail business is generally improving. New York City shows 100 per cent. increase, and large gains are shown in Philadelphia, Boston, Washington, Baltimore, Rochester, Syracuse and many other eastern points.

From other sections of the country good retail reports have been received. There is added business from the grain belts, and while business is poor in the cotton section, notwithstanding the bumper cotton crop, the average conditions throughout the country are particularly favorable.

In speaking directly on conditions in the war zone, Mr. Willys says: "Nearly all of the large automobile factories in Europe were entirely unmanned soon after the opening of hostility. Few cars will be built until these hostilities cease. In the meantime the entire field is open to the American manufacturer. For a time lack of transportation facilities will hamper foreign business, and abnormally high insurance rates will make shipping almost prohibitive. The seas are being rapidly cleared and soon export shipments will increase."



Streamline design used for 1915 Premier-Weidely roadster



Light four-cylinder Oldsmobile motor, showing a transverse section through the cylinder

Oldsmobile Continues Four and Six

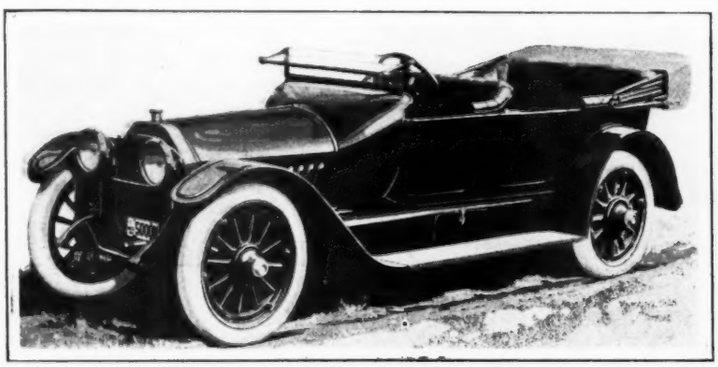
Cuts Price $60 on Small Car and $175 on Six —Wheelbase Lengthened on Smaller Car

As regards the models which it will produce for 1915, the policy of the Olds Motor Works, Lansing, Mich., is to continue the light four and the big six with very slight change mechanically, though body design, finish and refinement have been brought to an even higher standard and prices have been cut somewhat.

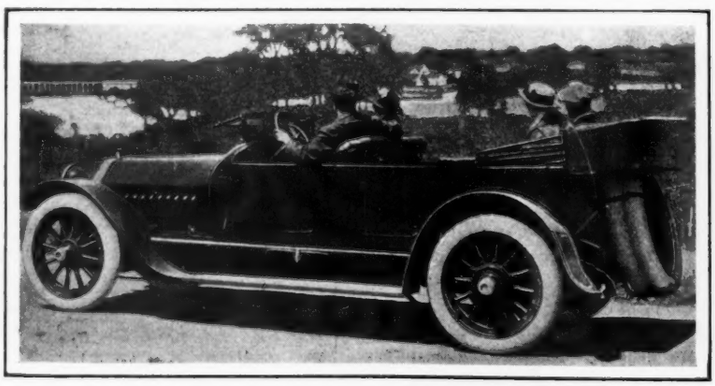
The light four, which made its appearance earlier in the year as the consort of the big six, has been reduced from $1350 to $1285, and besides the touring model, a roadster type has been added to sell at the same figure.

The big six, which formerly was offered in both five and seven-passenger touring types, may be had only in the seven-passenger form now. The old prices were $3150 for the car with seven-passenger and $2975 with five-passenger body, and on the new basis, the seven-passenger type is to sell at the figure which purchased the five-passenger model last season. Thus it is really reduced $175.

The light four still continues to be a light car *De Luxe*, for its finish and appointments leave nothing to be desired. They are really just as fine and elaborate as accorded the big car. Outwardly the light car appears to be a reduced copy of the six; its lines are about the same, it has the same distinctive panelling along the upper edge of the body, and the hood and radiator have the same general shape on a smaller scale.



Four-cylinder five-passenger touring model

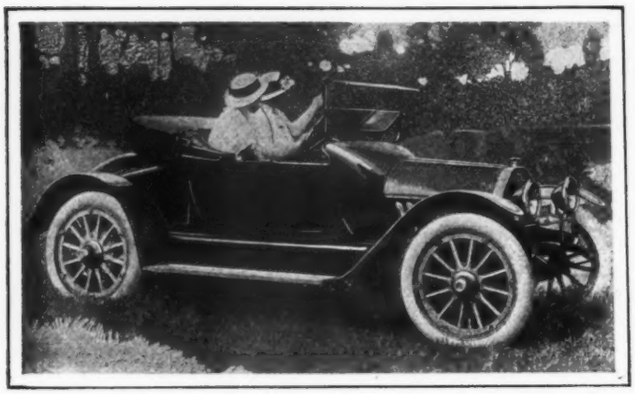


Six-cylinder seven-passenger Oldsmobile

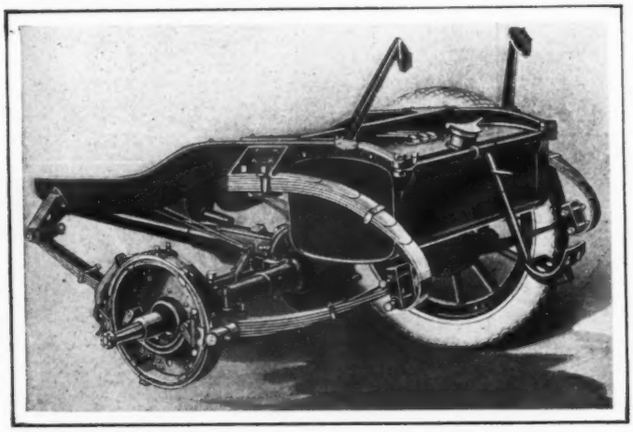
The Light Four Model 42

The principal difference between the light Olds four of today and that brought out earlier in the year is the wheelbase. It has been lengthened 2 inches to 112 inches. This has not affected the body size, but the front axle has been carried forward so that it now is in line with the radiator which formerly was 2 inches ahead of the axle. In addition, the front springs have been lengthened 1½ inches and are now 35½ inches between bolt centers, making a very easy riding car due to this length.

There has been no



Two-passenger roadster body mounted on the four-cylinder chassis



Rear suspension of gasoline tank on the Oldsmobile light four

change in the motor, which is a specially designed valve-in-the-head type by Northway for this car. It is a block-type which together with the gearbox forms a unit power plant of very neat design, compactness and lightness of weight being particularly noticeable.

The cylinders are 3½ by 5 inches, and, though the S. A. E. formula would not indicate it, give the engine a brake horsepower of 30. The piston displacement is 192.33 cubic inches and with these dimensions, the motor has ample power to give all the speed any owner could desire, it being able to turn up close to 60 miles an hour if given a chance. The motor might really be classed as a high-speed type as it develops its maximum power at about 2300 r.p.m.

Perhaps the most unusual feature of this over-head-valve motor is that no part of the long push rods or of the rocker arms, valves or springs, is exposed.

When the aluminum plate is in place over the valve mechanisms and rockers, it is hard to distinguish this motor from one of the conventional L-head types, and this housing of all valve parts also has the advantage of silence.

Delco Electrical System Used

The electrical equipment of the light four has undergone no changes save those minor detail improvements which the Delco concern has deemed advisable for greater reliability, with one exception. This is the addition of the automatic spark advance feature.

The Delco unit which combines the functions of cranking, lighting and ignition is located on the right side of the motor and as a generator it is driven by the same shaft as that which operates the water pump. The ignition distributer is in unit with the motor-generator. As a cranking motor, the unit connects through a train of gears to the teeth in the flywheel rim in the usual way. The reduction between engine and motor is 24 to 1, and the engine is cranked under average conditions at 100 revolutions a minute. As a generator, the apparatus begins to charge at 15 miles an hour. The system is a 6-volt type which uses an Exide storage battery of 60 ampere-hours capacity. This is located under the seat in a special steel container.

Lubrication of the motor is of the splash type with an individual splash trough under each cylinder. The oil is pumped from a reservoir on the side of the crankcase to the oil gauge on the dash and then feeds by gravity down to the troughs and to crankshaft and camshaft bearings. The connecting-rod ends dipping into the troughs throw the oil up into the cylinder walls and to the other bearings.

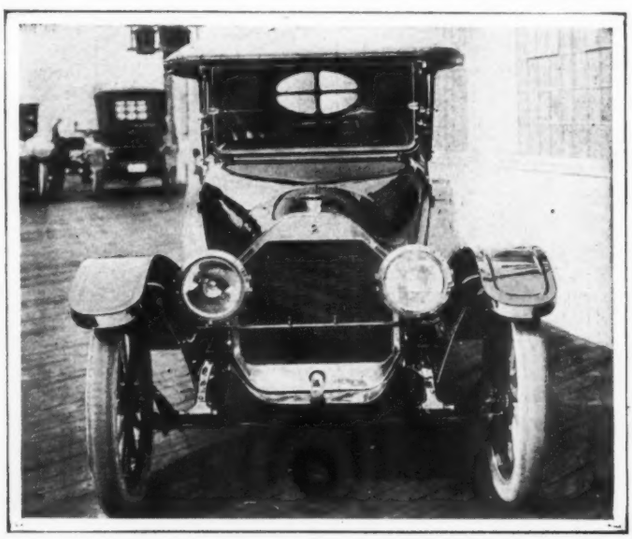
As in the motor unit, no change is apparent in the upper transmitting mechanism nor in the other chassis members. The clutch, which is housed with the flywheel, is of the cone type 12½ inches in diameter with a 2½-inch face and a cone angle of 11 degrees. From here the power goes to the three speed gearset of conventional type which bolts through flange construction to the rear of the flywheel housing and which is arranged for center control. The shaft is mounted on large ballbearings and transmit the power efficiently.

The propeller shaft is inclosed within a torsion tube, and is fitted with a universal joint at its front end. The rear axle is of floating type in which the driving shafts carry no part of the car weight. New Departure ball bearings and Hyatt roller bearings are used in the rear axle construction, the latter carrying the axle shafts and differential and the former taking the thrust. The shafts, of nickel steel, have a diameter of 1⅛ inch, while the main shaft is 1¼ inch diameter. Brakes, of conventional internal expanding and external contracting type, are 14 inches in diameter and have a width of 1⅞ inch. The braking surface is therefore ample.

The front springs are over the axle while the rears are underslung from it. These springs are 35½ and 48 inches long, respectively, and the width of all is 2 inches.

As has already been mentioned, nothing has been spared to make this light Oldsmobile a highly finished job. The cowl dash, for instance, is highly finished of Circassian walnut with compartments to right and left just as on the big car. The upholstery is of the best and equipment leaves nothing to be desired.

One slight change has been made in the body in that the back of the front seat has been made 2½ inches higher to add to comfort and appearance, the running boards are of aluminum and have mud scrapers at the doors. A refinement is the tool compartments which are concealed in the aprons at the sides. These are amply large for all paraphernalia



Front view of the light four model 42

A rain-vision, ventilating windshield, demountable rims carrying 33 by 4 tires front and rear, clock, Stewart speedometer, one-man top, Jiffy curtains, are some of the equipment features.

The car weighs 2615 pounds with tanks filled and extra tire on rear.

The Big Six—Model 55

The biggest change in the outward appearance of the six-cylinder Oldsmobile is the sloping of the cowl to meet the hood which is also somewhat sloped. However, the body is still along the same general lines as it was, and the same is true of the bonnet and radiator.

This car has a wheelbase of 139 inches which admits of an exceedingly roomy body for seven. It is in every way highly refined and distinctive in appearance.

The chassis has been hung so as to be 2½ inches lower than it was which is advantage from the standpoint of appearance as well as stability. This has been accomplished by dropping the yokes of the front axle spindles and by making the kick-up over the rear axle higher.

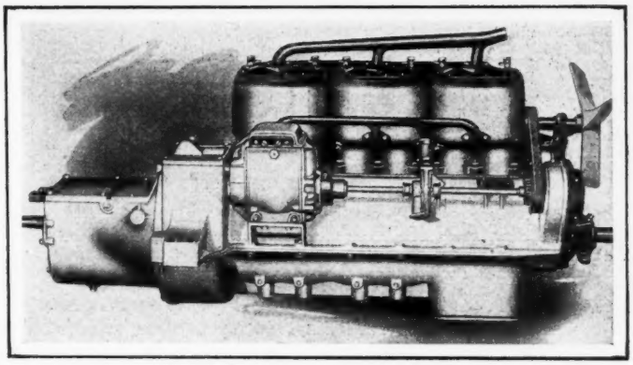
Another important change is the shifting from right to left drive, while the control has also been brought from the right to the center.

The motor is practically the same as it was except that the water jackets have been increased in size while the radiator depth has been made 4 inches instead of 3 1-2 and the cooling fan has come in for an increase of 4 inches in diameter, now being 18 inches. Thus the entire cooling system, which incorporates a centrifugal water pump, has been made more efficient.

Like a number of other cars of the year, the new Olds six has vacuum fuel feed using the Webb Jak vacuum tank which is mounted on the back of the dash. This causes the fuel to be drawn from the tank at the rear of the chassis which is still of 22 gallons capacity and has the same mounting.

A Marvel carbureter has replaced the formerly used make, while the engine-driven tire pump which is standard equipment is also of a new make—a Stewart. As an added refinement, Truffault-Hartford shock absorbers have appeared at the front.

Like the four, the motor is a Northway, although of an entirely different design, being an L-head type with cylinders cast in pairs. The valves are all on the left and intake and exhaust manifolds are separate units. The usual form of two-piece crankcase is used, it being split into two halves so that the upper half carries the crankshaft and camshaft bearings. Like all other Northways, it is a three-point suspended type which has the gearbox in unit with the motor.



Side view of the motor employed in the Oldsmobile six

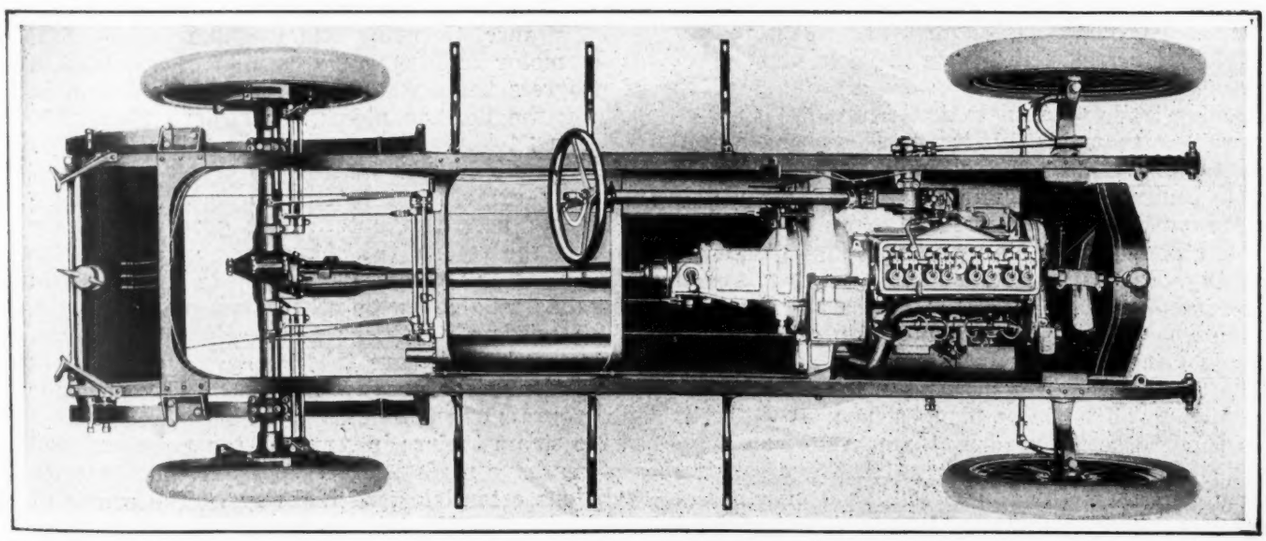
The bore is 4¼ inches and the stroke 5¼ inches, the piston displacement 447 cubic inches and the horsepower at 1600 revolutions is 50.

Like the four, the six uses the standard Delco ignition, lighting and cranking combination. In this case, too, there is the automatic spark advance feature, and the battery—also an Exide—is larger for its heavier work.

Unlike the four, the drive shaft of the six is not enclosed, but the torque and drive are taken by a pressed steel triangular torque arm, which parallels the shaft, and which is spring buffeted at its front end from a frame cross member. The drive shaft is of tapered section and is fitted with universals at either end. The tires are 36 by 5 inches.

Oldsmobile Power Plant Dimensions in Inches

PART	FOUR	SIX
Valve diameter	1 5-8	1 49-64
Valve seat	1-16 by 45 deg.	1-16 by 45 deg.
Valve stem diameter	3-8	3-8
Valve lift	5-16	11-32
Piston length	4 1-2	5
Connecting-rod length	10 3-8	11
Diameter piston pin	7-8	1
Length piston pin bearing	1 7-8	2 1-4
Connecting rod bearing length	2 1-4	2 1-4
Connecting rod bearing diameter	1 5-8	2 1-8
Front crankshaft bearing length	3 7-32	3 5-32
Front crankshaft bearing diameter	1 5-8	1 7-8
Center crankshaft bearing length	2 3-8	2 1-2
Center crankshaft bearing diameter	1 7-8	2
Rear crankshaft bearing length	3 7-16	3 15-16
Rear crankshaft bearing diameter	1 15-16	2 1-4
Diameter camshaft	1	1 1-4
Front camshaft bearing length	2	2 3-16
Front camshaft bearing diameter	1 1-8	1 1-4
Center camshaft bearing length	1	1 9-16
Center camshaft bearing diameter	2 1-8	2 3-16
Rear camshaft bearing length	1 3-4	2
Rear camshaft bearing diameter	1	1 1-4
Diameter flywheel	14	16 1-4
Flywheel face width	4 3-16	3 7-8



Plan view of the Oldsmobile light four-cylinder chassis, showing layout of the motor mounting and drive

The Automobile

PUBLISHED WEEKLY

Vol. XXXI Thursday, September 10, 1914 No. 11

THE CLASS JOURNAL COMPANY
Horace M. Swetland, President
W. I. Ralph, Vice-President E. M. Corey, Treasurer
231-241 West 39th Street, New York City

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Boston—1035 Old South Building Cleveland—516-517 Swetland Building

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SUBSCRIPTION RATES
United States and Mexico ---------- One Year, $3.00
Other Countries in Postal Union, including Canada ---------- One Year, 5.00
To Subscribers—Do not send money by ordinary mail. Remit by Draft, Post-Office or Express Money Order, or Register your letter.

Entered at New York, N. Y., as second-class matter.
Member of the Audit Bureau of Circulations.
The Automobile is a consolidation of The Automobile (monthly) and the Motor Review (weekly), May, 1902, Dealer and Repairman (monthly), October, 1903, and the Automobile Magazine (monthly), July, 1907.

The South American Method

AMERICAN automobile manufacturers should not imagine that because the doors of Europe are temporarily closed to South America that that continent will stampede to American markets and that the people of that continent will embrace all of our systems of doing business and accept our methods of merchandising without a murmur of dissent. One maker in this country imagined that all he needed to open his South American trade was a catalog in Spanish and some pictures of his factory.

Opening trade with South America today is a bigger problem than this. It is a harder problem now than it was 4 months ago, although to many it may appear easier. Before our trade can be well developed, without the aid of Europe, we must establish our financial arrangements there. England, Germany, France and Italy have their banks well represented in the big cities in South America. America has not. We have had to do our business through London, Berlin or Paris.

The South American business man has been accustomed to do business along somewhat different lines than those followed by many American automobile companies. The buyer in Argentina has generally purchased on 90 or 120 days. The dealer there has done business as follows: The merchant in London shipping goods to Buenos Ayres, when shipping time arrives, delivers his invoices and bills of lading to his London banker and gives him at the same time a draft at 90 or 120 days for the value of the goods. These documents are forwarded by the banker to his South American branch or representative. On arrival in South America the banker notifies the local buyer that the invoices, etc., have arrived. The merchant calls on the banker, who before surrendering the shipping documents, requires him to accept the draft, to write the word "accepted" on it as well as adding his signature. At the end of the 90 or 120 days the banker collects, and failure to meet such collections is, according to the South American laws, equivalent to putting the concern in bankruptcy.

Will American business houses not have to follow the present methods of doing business in South America, for a time at least? Today many of our concerns are practically unknown to the Latin business people in South America. We should first show them that we have enough confidence to do business with them in the ways they have been doing business for years. Thus we get acquainted. Once the business is opened, opportune times will come to introduce our methods of doing business, if the present ones do not prove satisfactory.

Highways and War

HORSE-PACE in war is practically unknown in the European campaign today—in its place are motor-pace methods. The horse is little used compared with former wars, except in the cavalry and branches of the artillery service, where there are not enough motor vehicles to meet the requirements and where the needs of the hour cannot be satisfactorily met with the present type of motor vehicle. *This is the first great motor war, with motors dominating every arm of the service.*

Nothing stands out more prominently in the use of motor vehicles than the great speeds as compared with horse systems, and when you add to these the aeroplane and the wireless systems, you have a combination that has revolutionized the methods of warfare. Were it not for the wonderful roads of Belgium, France, Germany and England this general use of motor vehicles would be impossible. Instead of progress there would be stagnation; instead of moving the heavier pieces of artillery 90 to 120 miles in 24 hours, there would be miles of motor vehicles stalled in the bad roads and complete movements of army corps halted—in fact, the general scheme of activities upset. But good roads have come to the rescue, they have been as essential as reliable motor vehicles, as reliable as the new field pieces, as reliable as the other arms of the service.

The wisdom of Cæsar has again been proven, roads, good roads, are the first great essential in civilization. The great highways of Europe made the progress of those lands possible before the days of the steam trains; in America the great railroad systems have made progress possible, but America lacks one essential, good highways. The events of the present would tend to prove that even today good roads are one of the country's greatest assets.

De Dion Plant Under Military Control

Staff of Workmen Reduced from 5,000 to 1,000, All Being Paid by the Government

NEW YORK CITY, Sept. 8.—Emanuel Lascaris, manager of the DeDion Bouton selling interests in America, returned Sunday from Paris, where he has been at the DeDion factory since July 25, 5 days before war was officially declared. Mr. Lascaris says that previous to the declaration of war that 5,000 men were regularly employed in the DeDion plant but that since war started only 1,000 men have been working. At present these are engaged entirely on the manufacture of commercial vehicles.

The DeDion factory, since August 1, has been under the control of the government. All of the workmen instead of wearing overalls wear soldiers' uniforms; the workmen are paid by the war department; and General Manager Sansonnens, who is a lieutenant of artillery, has been appointed military governor of the factory, which is, in short, a huge war camp under the control of the government.

The scenes around the factory on Saturday, August 1, the day on which war was declared, were stirring in the extreme. At 4 p. m. the factory was running full force when a messenger arrived from Puteaux announcing that the mobilization orders had been signed by the government. The factory whistle was blown, all men laid down their tools, received their money and left. The majority of them were in different parts of the army service and knew exactly where they were to report. The factory doors were locked and soldiers placed in control. The soldiers in charge, however, were generally those who have been associated with the factory and are now doing their military duty by working for the government in the production of motor trucks.

On that date, August 1, the government took possession of all cars that were on hand, and the eight DeDion army trucks which were competing in the army trials were taken.

Mr. Lascaris in describing the mobilization scenes around Paris on Sunday morning, August 2, says that the work was carried out with the greatest organization and quietness. On Sunday morning there were 1,000 motor buses and trucks in the Champ de Mars, one of the public squares in Paris which was a great military camp. By Monday, all of these buses were gone, having carried their loads of soldiers to the front. In many other parts of the city similar scenes were being enacted. He thinks that there are at present upward of 80,000 passenger cars and trucks in the service of the French army. All officers use high-powered touring cars. Horses are not used except in the cavalry. The English army has gone somewhat further than the French in the use of motor cars. The English army has taken chassis and used these for hauling the artillery. A fifth-wheel device is mounted on the rear of the chassis and to this the heavy artillery carriage is attached. With this arrangement the artillery can be moved 90 to 100 miles in one day.

Only Four Tires Remain at War Scare Prices

Plenty of Crude Rubber Now in Stock in This Country, Large Shipments Having Arrived

NEW YORK CITY, Sept. 8—Tire prices in general have come down to normal conditions. Five tire companies have reduced prices to those in effect before the war started, including the Firestone, Pennsylvania, Lee, Empire and Federal. Only four companies are now selling their tires at advanced rates. These are as follows: Fisk, 15 per cent.; Goodrich and Diamond, 12½ per cent.; Republic, 12½ per cent., and the United States Rubber, 12½ per cent. It is expected, however, that one or two of these companies will reduce their prices in the near future.

A letter has been sent to the various rubber industries asking them to take up, through their respective senators and representatives, with the State Department at Washington, the matter of getting exemption for cargoes of raw material, that might be afloat in ships that left their ports before the declaration of war.

According to the Custom House, port of New York, 11,534,864 pounds of India, Balata, Gutta percha and Gutta jelutong rubber was imported during July. On July 23, the St. Louis left Southampton with a consignment of 67,000 pounds of plantation rubber for the Goodyear Tire & Rubber Co. On July 27 the *Minnewaska* left London with 95,000 pounds of plantation rubber for the same company. The B. F. Goodrich Co. has 150,000 pounds of plantation rubber on the *Chalister*, which left Singapore on July 30. It also has 150,000 pounds more of plantation rubber on the *Indrania*, which left Singapore on August 12. The Goodyear has 85,000 pounds of the same kind of rubber on the *Olympic*, which left Southampton, August 5, and also 33,500 pounds on the *New York*, which left the same place on August 10. All have arrived. The *Minnehaha* has arrived with over 600,000 pounds of crude rubber for the Goodyear company. The *Minnetonka* arrived September 7 in this port. On September 9, the Goodyear company expects to send by rail to Akron, O., thirty-five cars full of crude rubber. This is supposed to be the largest single shipment of rubber ever made from this city.

The Finance Minister of Brazil contemplates dispatching to the United States several vessels carrying rubber from Para, to bring back food and other products.

"America's Chance to Reach Its Zenith"

NEW YORK CITY, Sept. 4.—That an understanding of the characteristics of the South American people is essential before making progress in a business way in the Latin American continent is the opinion of Edward V. Douglass, secretary of the American Manufacturers' Export Association. This association, which is devoted to the fostering and promotion of the business and commercial relations between American manufacturers and foreign nations, has among its members many concerns which are either directly or indirectly interested in the automobile industry. Among its members may be mentioned the Ford Motor Co., Joseph Dixon Crucible Co., General Electric Co., Indian Refining Co., Standard Oil Co., Studebaker Corp., and the Willys Overland Co.

Speaking of South American people, Mr. Douglass said:

"Broadly speaking, there are but two classes of people throughout South America, the wealthy and the poor. There is not the enormous middle class that we find in the United States, and hence there can never be considered the large percentage of car buyers throughout these countries that we find in this country. Here there are no distinct class of people. Those of different incomes cannot be distinguished from one another.

"It is this condition in South America that gives rise to the fact that the cars that are bought are of the higher priced variety. The South American loves to make a show.

"Now is the opportunity, however, for America to step in. New York is the logical financial center of this hemisphere and since the war has shattered Europe, there seems to be no reason why there should not be a sharp increase in trade between the two continents. Every country has its period of rise and fall and this seems to be the opportunity for the United States to reach its zenith."

DETROIT, MICH., Sept. 9—S. A. Douglas has resigned from the Johns-Manville Co. and together with H. W. Kane will act as factory distributors for the following concerns: Simmons Mfg. Co., Doehler Die Casting Co., Standard Rolling Mills, Wisconsin Aluminum Foundry Co., and the Pontiac Drop Forgings Co., with sales offices in Detroit and Chicago.

Gasoline Free of War Influence, Says Standard Oil Official

Plenty of Crude Oil in Sight for at Least 2 Years with More Chance for Slight Decline Than Raise in Price

NEW YORK CITY, Sept. 8—That the international war which is tearing at the vitals of foreign countries will have no effect, either now or in the near future, upon the price of gasoline and lubricating oil is the expressed opinion of an official high in authority in the Standard Oil Co. The price of gasoline may even go down a fraction of a cent, he says, and in the next 2 years it will not increase more than 1 cent a gallon and probably not that much.

According to this official, who is in a position which gives him opportunity to survey the oil field, there is plenty of crude oil now in sight to last during at least two years, during which time it is extremely unlikely that there will be any appreciable change in existing prices.

Speaking of conditions in the oil industry, he said:

"Of course it is impossible to state positively what the next two years may bring forth, but there is nothing in sight now which leads us to think that there is any likelihood of a shortage of crude within that period, or, in fact, for a much longer period.

"The only effect the war situation can have is to decrease the demand for gasoline and lubricating oil in the foreign field. It is obvious that Europe will not employ motor cars as extensively as has been the case in the past and naturally the demand will be tremendously decreased.

"That being the case, and if the price is influenced by supply and demand, why will there not be a lower figure than at present?" was asked.

"Because the existing price is about the lowest that gasoline can be sold with a profit to the refineries," was the answer. "Take New York, for example, where an enormous amount of gasoline is used. The Standard Oil Co. receives from 9 to 11 cents a gallon from garages and private tank stations, the difference in price being due to transportation costs. Some deliveries cost us more than others. We cannot sell our product for much less and realize a living profit."

May Change Special Box Car Sizes

NEW YORK CITY, Sept. 8—As a result of the work of the Traffic Department of the National Automobile Chamber of Commerce, the American Railway Assn. has now under consideration a change in the plan for special box car dimensions that will make more convenient the shipment of motor cars.

The Railway association has been considering that special equipment should not exceed inside dimensions of 40 feet 6 inches length, 8 feet 6 inches in widtht and 9 inches in height. As the automobile industry requires 40- and 50-foot cars, 10 feet high inside for a very considerable portion of its shipments, a formal protest was sent to the Railway association and is now being considered.

The Chamber will have a representative in attendance at Chicago on September 16, when the Western Classification Committee holds a hearing on a number of matters pertaining to the classification of automobiles and parts.

No Lower Rates for Light Cars

The Chamber has been notified that the Official Classification Committee has refused the application of light car manufacturers for a lower minimum on machines of that type than applied on other automobiles.

In its conference with the Official Classification Committee, the Traffic Department has arranged that instead of enforcing the rules that bodies for freight vehicles be boxed or crated for shipment, there will be a modification so that after October 1, bodies for platform, stake or dump trucks or wagons not lettered may be shipped without being boxed or crated.

Germany Dominated 1913 Motor Trade with England

LONDON, ENG., Aug. 29.—At the present juncture it is interesting to note the extent of the trade done in motor cars, chassis, and parts between Great Britain and Germany. It will be seen from the following figures, which are taken from the last Annual Statement of the Trade of the United Kingdom with Foreign Countries and British Possessions, compiled in the Statistical Office of the Customs and Excise Department, that Germany stands to lose a much greater volume of trade than Great Britain in this particular branch of industry. The total value of the imports of cars, chassis, and parts (including tires) from Germany to Great Britain last year was £1,355,974, which was an increase of £148,819 upon the figures of the previous year, following a gradual increase since 1909. Great Britain's exports of motors, chassis, and parts to Germany, however, only amounted to £113,435 in 1913, a figure to which they had gradually grown since 1909, when they only amounted to £11,838. Great Britain's exports to Germany of foreign made cars, chassis, and parts, which are first imported into Great Britain and then re-exported, have not shown any very material expansion during the 5 years under review, as they stand now at only £39,109, against £21,315 in 1909.

The following are the details bearing out the general statements just made:

IMPORTS OF CARS, ETC., FROM GERMANY TO GREAT BRITAIN

	1909 Pounds	1910 Pounds	1911 Pounds	1912 Pounds	1913 Pounds
Complete cars	25,577	66,747	102,237	124,451	90,963
Chassis	114,421	153,900	192,508	217,973	135,998
Parts	685,497	772,041	753,235	864,731	..
*Rubber tires and tubes	..	..	..	..	929,755
Other parts	..	..	..	..	199,258
Totals	825,495	992,688	1,047,980	1,207,155	1,355,974

*Tires are now classified separately from "other parts."

It will be seen that there is a great falling off in complete cars and chassis. The increase in the value of parts imported from Germany is probably due principally to tires, the value of which for 1913 exceeded by £65,024 the total value of parts of all kinds imported during the previous year, although some portion may be owing to the use of German made magnetos.

Great Britain's export trade in motor cars, chassis, and parts with Germany is not very large. Indeed, as far as complete cars are concerned, during the past 5 years the number was apparently not sufficiently large to be separately entered in the returns. British made chassis and parts sent to Germany during the past 5 years were as follows:

EXPORTS OF BRITISH CHASSIS AND PARTS TO GERMANY

	1909 Pounds	1910 Pounds	1911 Pounds	1912 Pounds	1913 Pounds
Chassis	740	8,573	25,136	12,990	10,767
Parts	11,098	32,506	52,725	75,278	..
*Rubber tires and tubes	..	..	..	..	30,994
Other parts	..	..	..	..	71,674
Totals	11,838	41,079	77,861	88,268	113,435

*Tires are now classified separately from "other parts."

A certain number of cars and parts of foreign and Colonial manufacture imported into Great Britain are re-exported. With Germany Great Britain's trade under this head is represented by the following figures:

EXPORTS OF FOREIGN AND COLONIAL CARS, ETC., TO GERMANY

	1909 Pounds	1910 Pounds	1911 Pounds	1912 Pounds	1913 Pounds
Complete cars	6,524	7,796	13,225	17,628	13,059
Chassis	8,005	10,738	11,691	5,798	7,035
Parts	6,786	14,200	11,709	12,551	..
*Rubber tires and tubes	..	..	..	..	13,364
Other parts	..	..	..	..	5,651
Totals	21,315	32,734	36,625	35,977	39,109

*Tires are now classified separately from "other parts."

—From *The Autocar.*

File Claims for Commandeered Cars

WASHINGTON, D. C., Sept. 4.—Americans whose automobiles were commandeered by military authorities in some of the European countries have begun filing claims with the State Department.

Most of the tourists were given receipts for their cars with the promise that they would be reimbursed.

Critchley Directs Britain's Motor Transports

LONDON, ENG., Aug. 29—J. S. Critchley, President of the Institution of Automobile Engineers, has been appointed by the War Office an inspector of mechanical transport. This position carries rank as an officer in the Army Service Corps.

Many 1915 Models at Detroit and Indianapolis State Fairs

Governor Ralston Opens Indianapolis Debut of New Season's Cars, Under Huge Tent

INDIANAPOLIS, IND., Sept. 7—Governor Samuel M. Ralston at 2 o'clock this afternoon formally opened the fall motor show of the Indianapolis Automobile Trade Assn. at the Indiana State Fair. This is the second show the association has given this year.

The show is being held in a tent at the fair ground, near the Coliseum. The tent contains 39,800 square feet of space, of which 30,000 square feet is available for exhibits. There are fifty-one exhibitors.

Special exhibitors are the Indianapolis Motor Speedway, the Hoosier Motor Club, the Howe Engine Company and Charles H. Black who is showing a gasoline car he built in 1891 and which he claims is the first successful gasoline car built in the United States.

Briscoe Touring Car Is Now $785

DETROIT, MICH., Sept. 8—*Special Telegram*—The Briscoe Motor Co. has reduced the price of its touring car from $900 to $785 while the price of the roadster remains $900. These prices are for cars fully equipped with electric starter. Thirty cars are being made now daily and production will be greatly increased from October on.

Imperial Line to Be 1 Four, 2 Sixes

DETROIT, MICH., Sept. 8—Three models instead of four will constitute the Imperial line for 1915. In place of two fours and two sixes, there will be one four and two sixes. One of the latter is an introduction to the Imperial line, being a light six model.

The model 64 four-cylinder car in both roadster and touring car bodies, sells for $1,085 for the 1915 season in place of $1,500 last year. This car has a 3.75 by 5 inch motor fitted with a Stromberg carbureter, Gray & Davis starting and lighting system and battery ignition. The wheelbase is 115 inches and the tires 32 by 3.5 all around. This car is equipped with left drive and center control.

The model 56 six-cylinder is a larger edition of the four cylinder model, having the same size cylinders as the four. It is fitted with a Splitdorf magneto, Stromberg carbureter and a North East starting and lighting system. The wheelbase is 130 inches and the tires are 36 by 4.

The Imperial light six will be shown for the first time at the Chicago show. It will cost $1,535 for a seven-passenger body. It will be fitted with a Continental block engine of 3¾ inch bore and 5 inch stroke. It will have the Gray & Davis starting and lighting, Stromberg carbureter, wood wheels and 34 by 4 inch tires.

New Paterson Four on View in Detroit

DETROIT, MICH., Sept. 8.—A new Paterson four-cylinder car is being shown in Detroit. Its price is $1,085 instead of $1,200 as asked for the 1914 model. It has Northway block motor, of 3.5 bore by 5-inch stroke, Delco starter and lighting system, Schebler carbureter, 112-inch wheelbase and 33 by 4-inch tires. The axles are Weston-Mott, semifloating. The standard color will be blue and the bodies of streamline design. There will also be a new six-cylinder but this is not ready for announcement at the present time.

$860 for Chevrolet Roadster, Complete

FLINT, MICH., Sept. 8—The 1915 Chevrolet line consists of the Baby Grand model, four-cylinder touring car selling at $985 with electric starter and lighting system and the Royal Mail roadster selling at $860 with full electric equipment.

Both cars have the four-cylinder block Mason motor having a bore of 3 11/16 inches and a stroke of 4 inches. The Zenith carbureter will be fitted as standard equipment. On the cars that are specified to have an electric lighting and starting system, the Auto-Lite company's product is employed. Where electric lighting and starting is not used, the price is $875 for the Baby Grand model and $750 for the Royal Mail. In this case the Simms magneto is standard equipment.

The wheelbase remains at 106 inches and the tires are 32 by 3.5 all around. The wheels are wood. Left steering with center control is also continued. The axles are the Walker-Weis semi-floating type and the color is gun metal on the regular stock cars.

Price Cuts in 1915 Abbott-Detroits

DETROIT, MICH., Sept. 8—Abbott-Detroit 1915 cars will be much the same as the 1914 models except that there will be a cut in price and new streamline designs of bodies. The six-cylinder roadster model G will sell for $100 less than it did in the 1914 model, being now $2,190. The six-cylinder seven-passenger model F remains at $2,290 and the four-cylinder seven-passenger model L at $2,885. The four-cylinder five-passenger model K will sell for $1,785.

Six 1915 Detroit Electrics Announced

DETROIT, MICH., Sept. 8—The complete 1915 line of the Anderson Electric Co., makers of the Detroit electric, consists of a cabriolet roadster selling at $2,650, a rear-drive brougham selling at $2,850, duplex-drive, $3,000, forward-drive, $2,950, large rear-drive brougham, $2,950, small rear-drive brougham with bevel gear, $2,600. Wire wheels are optional.

Gasoline Tax To Yield $20,000,000 Yearly

WASHINGTON, D. C., Sept. 9—The first draft of the emergency revenue bill, which is to be passed in accordance with the recommendation of President Wilson, was completed today by the Democratic members of the Committee on Ways and Means.

One of the essential details of the bill, which will be submitted to the House the latter part of this or early next week, is the tax on gasoline of $0.02 per gallon, which it is claimed will yield about $20,000,000 a year.

Clayton Bill Passed—Hits Patent Monopoly

WASHINGTON, D. C., Sept. 3—The Clayton bill, the second and last of the administration trust measures to be considered at this session, passed the Senate by a vote of 46 to 16. The Senate struck from the House bill sections, 2, 3 and 4 relating to unfair trade practices, and substituted section 4, known as the Walsh amendment, intended to prevent the patent monopoly, which the Supreme Court is supposed to have recognized by its decision in what is known as the Dick mimeograph case.

Columbus Dealers Wroth at Fair Conditions

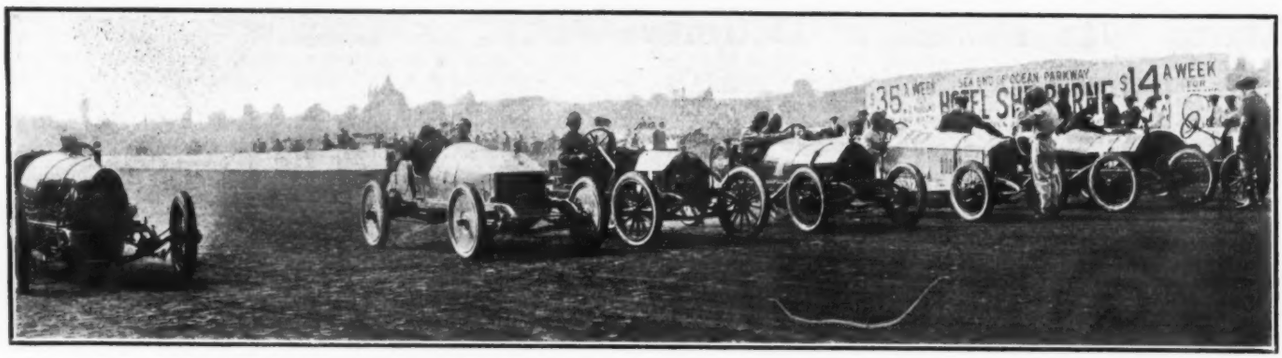
COLUMBUS, OHIO, Sept. 7.—The Columbus Auto Trades Assn., an organization composed of agents in central Ohio territory, has adopted resolutions in the form of an ultimatum to the board of managers of the Ohio State Fair. The ultimatum protests against the charging of an admission of 50 cents for each and every one connected with the automobile exhibits, without pass out checks and also against the location of the automobile displays. It is claimed that many of the displays were placed near stone crushers and thereby ruined by the dust. The roofs of buildings leaked and damaged cars on exhibition also. It was agreed that no displays of automobiles be made by Columbus dealers at the next state fair unless the conditions were remedied.

Hup Dealers Convene in Minneapolis

MINNEAPOLIS, MINN., Sept. 7—The Hupmobile dealers' convention in Minneapolis Sept. 8-9-10, with entertainment features by the R. W. Munzer & Sons Company, was attended by factory officials who drove up in a 1915 five-passenger car. They were President J. Walter Harris, Commercial Manager F. A. Harris, General Sales Manager F. J. Mooney, and Factory Superintendent S. H. Humphreys. A dinner was given Thursday night at which W. E. Lee, one of the candidates for governor in Minnesota, and Mayor W. G. Nye spoke.

Mercer Discontinues Racing Temporarily

TRENTON, N. J., Sept. 7—Following the unfortunate accident in the Elgin road race August 22, when Spencer E. Wishart was killed, and his mechanic, John C. Jenter, later died from injuries, the Mercer Automobile Co. has decided to discontinue racing for the remainder of this year at any rate.



Line-up of cars preparing to start in 50-mile event on Saturday. DePalma in No. 10 won this race

De Palma Draws 15,000 to Brighton

NEW YORK CITY, Sept. 8—Ralph De Palma, piloting a Mercedes, was the bright particular star at the 2-day race meet staged by the Motor Dealers' Contest Assn. at the Brighton Beach seaside track, Saturday and Monday, September 5 and 7.

With only two exceptions, De Palma won every event in which he started, the only races which he lost being the two free-for-all handicaps in which he was unable to overcome the advantage of those who were pitted against him. Not only did he win the 100-mile Labor Day Sweepstakes, which was the feature event on Monday, forcing his Mercedes 100 times around the mile circuit in 1:40:15, but he won the 50-mile "warming up" trip which was run off on Saturday and was the feature event of that day. In this race his time was 50:42 2-5. In several of the races better time was made than ever before on the old Brighton Beach track.

During the 2 days of racing there was one unfortunate incident. When Frank Dearborn was driving his Peugeot in second place in the 50-mile feature event on Saturday the right front tire blew out, precipitating the car, after a long skid, through the outer fence on the grandstand turn. Later it developed that Dearborn had sustained a fractured skull and internal injuries, and that Harold McCarthy, his mechanician, was quite seriously injured internally.

At the hospital it is reported on Wednesday morning that Dearborn died at about midnight; he had remained unconscious since the accident. McCarthy, however, who was less seriously injured, a splinter of one of his ribs having punctured his lungs, has greatly improved and quite likely will recover.

At the time of the accident Dearborn was in his 41st mile and was racing to make up time which he had lost because of a stop for tires. Throughout the race, up to this point, it had been a see-saw affair between De Palma, Dearborn and Le Cain. De Palma won, his time being 50:42 1-5.

Of the other events on the program on Saturday the 10-mile class C race, which was won by De Palma in 10:20 3-5, proved the most exciting. For 9½ miles De Palma and Morton, in a Mercer, raced practically wheel to wheel; only at the finish line did De Palma forge ahead, winning by inches. Otherwise there was practically no competition, the winner in each case running away from his field. In the 25-mile free-for-all De Palma bettered his own time of 24:35, made last year with a Mercer, by covering the distance in 24:08 2-5.

Reversing his previous practice of driving only fast enough to beat out his nearest competitor, De Palma early assumed the lead in the 100-mile Labor Day Sweepstakes, and at the finish had opened a gap of 5 miles between himself and Bergdoll in his Erwin. The absence of Dearborn and his Peugeot robbed the contest of much of its interest, for next to De Palma's Mercedes the Peugeot was undoubtedly the fastest car on the track. The summary:

Saturday, September 5

CAR	DRIVER	TIME
10 Miles, Class C, 161-300 Cu. In.		
Mercedes	DePalma	10:20 3-5
Mercer	Morton	
Chevrolet	LeCain	
10 Miles, Class C, 301-600 Cu. In.		
Peugeot	McCarthy	10:34 4-5
Stutz	Morgan	
25 Miles, Class E, Free-for-all.		
Mercedes	DePalma	24:08 2-5
Chevrolet	Jessop	
Erwin	Bergdoll	
10 Miles, Class D, Free-for-all Handicap		
Peugeot	Dearborn (10s)	9:02 4-5
Chevrolet	Le Cain (40s)	
Mercedes	DePalma (scratch)	
50 Miles, Class E, Free-for-all		
Mercedes	DePalma	50:42 2-5
Chevrolet	LeCain	
Marquette	Galvin	
Chevrolet	Jessop	

Monday, September 7

CAR	DRIVER	TIME
10 Miles, Class C, 161-300 Cu. In.		
Mercedes	DePalma	10:00 4-5
Mercer	Morton	
Erwin	Bergdoll	
10 Miles, Class C, 301-600 Cu. In.		
Stutz	Dickinson	11:02 2-5
Buick	Galvin	
Lozier	Geblin	
10 Miles, Class D, Free-for-all Handicap		
Chevrolet	LeCain (40s)	10:14 1-5
Mercedes	DePalma (scratch)	
Mercer	Morton (20s)	
100 Miles Labor Day Sweepstakes		
Mercedes	DePalma	1:40:15
Erwin	Bergdoll	
Chevrolet	Jessop	

Disbrow Fast at Michigan Fair—Show Also

DETROIT, MICH., Sept. 8—The 2 days' race meet at the Michigan State Fair held September 6 and 7 was probably the best attended ever held in Detroit, 10,000 people being present both days. Louis Disbrow, driving the Simplex Zip, was the big winner of the meet, taking six firsts. His car made the fastest time, covering 1 mile in 50 and 2/5 seconds. His time of 9 minutes 16 2/5 seconds in the 10-mile race is claimed fastest ever made in open competition on circular track.

Bob Burman was forced out on the first day owing to a broken piston rod on his Peugeot and again on Monday. The finish in the 10-mile race Monday ended in a dead heat between Hearne in a Case and Raimey, also in a Case, in 9 minutes 42 seconds.

At the motor car exhibition at the State Fair, local agents or branches are showing the 1915 Maxwell, Overland, Regal, Mitchell, Krit, Studebaker, Buick, Hupmobile, Jackson, Premier, Oldsmobile, Grant, Detroiter, Haynes, Oakland, Peterson, Imperial, Chevrolet, Hudson, Ford, Cartercar, Reo, Detroit electric. Among the commercial vehicles exhibited are the Federal, Commerce, Standard and Kelly-Springfield.

Races Save Iowa Fair from Deficit

DES MOINES, IA., Sept. 7—A day of automobile races saved the Iowa State Fair this year from what promised to be a financial deficit and from showing a heavy loss in attendance. The final day of the exposition was given over to the races in which several drivers of note participated and the crowd

Starter Wagner flagging Peugeot winning 10-mile race at Brighton

attracted for the automobile events saved the day for the state fair. The receipts of the final day were enough for the fair to show a profit of over $20,000 and to cut the loss in attendance as compared with last year to only 8,000.

Nearly 25,000 people attended the races. The big feature was the final free-for-all in which Louis Disbrow drove his Simplex Zip across the tape with its nose projecting by inches only beyond that of Johnny Raimey's Case. Another feature was a race between Eddie Rickenbacher, winner of the Sioux City race, and Lincoln Beachey, the aviator. Beachey negotiated the half mile track four times while Rickenbacher went around thrice. Disbrow was a winner from the start. In the 1-mile test he made the two laps in 1:09 1/5 and Raimey was second in 1:10 1/5 while Rickenbacher was third in 1:10 3/5. O'Donnell's Duesenberg was first in the 3-mile event in 3:45 3/5. Disbrow cut the mile record of 1:08 4/5 to 1:08 3/5.

Home Talent in Washington Fair Races

TACOMA, WASH, Sept. 1.—Automobile races under the auspices of the Northwest Automobile Assn. were the feature August 30 at the Southwest Washington Fair at Centralia.

Jim Parsons, the favorite Northwest driver in the Romano Special, won four out of the five races on the program, in spite of having his car go through the fence prior to the start of the day's races.

The first race was for a mile against time from a flying start. Parsons won in 1:10 1-2; Joe Krause second, Velie, 1:15 1-2; Fred Hess, Ford, 1:17 1-2; C. Latta, Lozier, 1:18 1-2; Ray Lentz, Farco, 1:19, and Earl Staley, Studebaker, 1:24 1-2.

The second race was won by Staley in a Studebaker. The third race was for five miles between the three fastest cars in the first race and was won by Parsons in 6:36. The Velie's time was 6:37 and the Ford's 6:44 1-2.

The fourth race, a 10 mile free-for-all, was all Parsons' again, won in 13:14. The last event, an Australian pursuit race, was won by Parsons in less than three miles by passing the Ford and Velie in order. Over 3,000 was the attendance. Track was in good condition. Races were under the personal direction of Robert A. Hiller and were a success.

Entries Open in Los Angeles-Phoenix Race

LOS ANGELES, CAL., Sept. 2.—The first entry for the Los Angeles-Phoenix-San Diego Exposition road race is that made by Don Lee, who entered a Cadillac, to be driven probably by Harry Ham. A second Cadillac will probably be entered by Louis Nikrent.

The classification of the race is given as class E, free-for-all. The entry fee is $200 up to October 8 and $300 after that day up to October 22.

The size of the purses will depend entirely upon the number of entries. For instance, if there are 40 cars entered the six purses will be $3,500, $2,250, $1,750, $1,250, $1,000 and $500. If there are 30 entries the purses will be $3,000, $2,000, $1,750, $750, $500 and $250. If there are 25 entries the five first to finish will receive respectively $3,000, $2,000, $1,500, $500 and $250. If there are only 20 entries there will be only four purses, of $2,500, $2,000, $1,500 and $500. Should there be 10 entries only then first prize will consist of $2,500, second $1,500 and third $500.

The course will be practically the same as last year except between this city and San Diego, as Riverside is to be placed upon the route this year.

Four Perfect in Light Car Run

NEWARK, N. J., Sept. 8—Four cars out of nineteen contestants, who started from this city on September 5 on the 300-mile reliability light car run of the Cyclecar Club of N. J., to Atlantic City and return, returned last night with perfect scores.

The four cars were the sole survivors of the run. For the last 2 days the tour was a battle royal between G. A. McLaren, of this city, driving a Twombly, and C. A. Coey, of Chicago, driving a car of his own manufacture. Not only did McLaren and Coey finish in the same time which they had at Atlantic City the day before, but two other Jerseyites, Harry Seward, of Rutherford, and E. W. H. Riepel, of Ridgewood, in a Zip, also secured a perfect score.

Most of the competing cars averaged 35 miles to the gallon of gasoline, while Coey went through the trip without a puncture.

Elmer Thompson to Direct Parade

NEW YORK CITY, Sept. 5.—It was decided to proceed with plans for a great motor car pageant at a luncheon of the New York Commercial Tercentenary Commission yesterday. The luncheon was in the rooms of the Automobile Club of America.

Elmer Thompson, secretary of the automobile club, was unanimously chosen chairman of the automobile auxiliary committee.

According to tentative plans which have been adopted there will be a mammoth motor car parade, which, it is proposed, will be divided into four sections, industrial, floral, grotesque and electrical. In each division there will be separate prizes for the winners selected by the judges. In addition there will be a grand prize. This probably will be a large gold medal.

The parade is to take place during the evening of Wednesday, October 24, and it was announced that already the Colgate company and the makers of the Thermos bottles have entered floats. An appropriation of $10,000 has been made for the purpose of illuminating the line of march.

More than 40 guests were present, among them:

Alfred Reeves, National Automobile Chamber of Commerce; A. G. Batchelder, American Automobile Association; Fred Wagner, Vice-President George F. Kuntz, Tercentenary Commission; William C. Poertner, Poertner Motor Car Co.; George H. Duck, Motor Truck Club of America; Elmer Thompson, Secretary Automobile Club of America; Secretary De Forest, of the Harlem Board of Trade; Secretary E. H. Hall, Tercentenary Commission; Harvey Robinson, Electric Vehicle Association of America; M. L. Downs.

Eight Cars Start in Wisconsin Tour

MILWAUKEE, WIS., Sept. 7—*Special Telegram*—Eight cars are contesting in the fourth annual Wisconsin Trade Tour which started from Milwaukee this morning and which reached Green Bay, Wis., tonight with every car showing a perfect score.

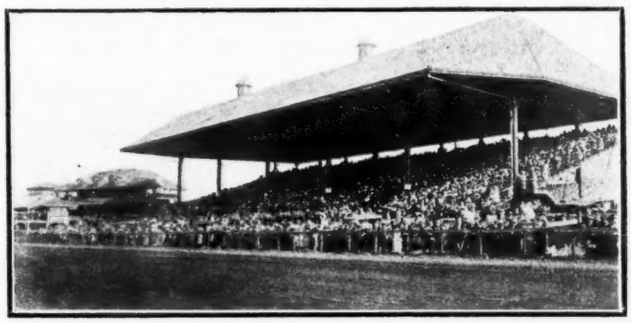
In the dealers' division are Buick, Jeffery, Franklin, new R. C. H., Studebaker and Chevrolet, while in the private owners' division are J. B. Babcock, Franklin and O. H. Stenzel, while the run for the last 3 days covered 483 miles.

The tour is under grade one rule with special regulations framed to cover the stock car angle; both reliability and fuel economy figure in the rules.

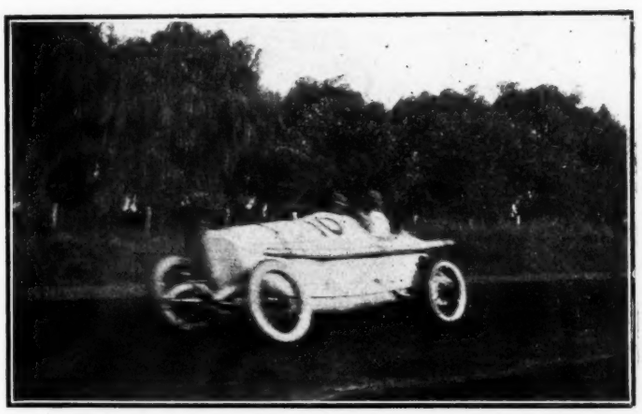
"Keep Money in Circulation"—Mitchell Branch

MILWAUKEE, WIS., Sept. 7—The Milwaukee branch of the Mitchell Automobile Co., 528-532 Broadway, has just issued a letter to its customers which reads:

"The business conditions of today and for the immediate future are largely what you and I choose to make them.



Crowd in grandstand on Labor Day at Brighton races



De Palma speeding on the back stretch in Brighton races

Each one of us can help boom things by forgetting the hole in the doughnut and forging ahead as though nothing unusual was happening on the other side of the pond.

"We have reason to be optimistic. The Mitchell factory in Racine was never before so busy at this season of the year. Why shouldn't this be the case, with good crops all over the country for which growers are receiving the highest prices in history?"

—

Maxwell Plant Entertains 100 Dealers

INDIANAPOLIS, IND., Sept. 8—About 100 Maxwell dealers attended a meeting in Indianapolis September 1 and were the guests of R. L. Malkin and G. H. Williamson, district salesmen for the Maxwell Motor Sales Corp. for Indiana and eastern Illinois. There was an exhibition of motion pictures, showing the manufacture of the Maxwell 25, a luncheon and a number of interesting talks.

—

Bonnell To Handle Dodge in Newark

NEWARK, N. J., Sept. 9—The Bonnell Motor Car Co., this city, has been incorporated with a capital of $100,000, to handle the Dodge car in this territory. The incorporators are Horace A. Bonnell, Jacob W. Mason and A. M. Bonnell. A salesroom will be opened at 273-275 Halsey street.

—

Houpt Handles Mitchell in Five States

NEW YORK CITY, Sept. 8—Harry S. Houpt has taken on the Mitchell line for New York State, New Jersey, Pennsylvania, Delaware and Maryland, embodying a population of over 15,000,000.

He will also continue to handle the Lozier. He has at present agencies in this city, Brooklyn and Philadelphia. He will establish new dealers in those communities where the Mitchell is not represented.

William Wield has been appointed wholesale manager. A stock of $160,000 in repair parts is being carried.

—

Chalmers' Earnings for Fiscal Year, $1,121,929

NEW YORK CITY, Sept. 4—The Chalmers Motor Co.'s balance sheets as of June 30, 1914, shows its assets as follows:

Cash, $1,039,491; notes and accounts receivable, less reserve, $939,703; merchandise inventories, less reserve, $3,473,162; prepaid expenses, $23,759; stock of other companies, $527,599; sales branches, $30,961; plant and equipment, $2,113,278; good will, $1; total, $8,147,958.

Liabilities—Current merchandise accounts, $560,860; deposits, dealers' contracts, $93,408; accrued accounts, $32,278; reserves, $200,881, preferred stock, $1,319,300; common stock, $5,000,000; surplus, $941,229; total, $8,147,958.

According to these figures, $180,700 of the preferred stock has been retired, or $5,700 more than is required per year.

Adding this retired preferred stock to the surplus, $941,229, the company would have earned $1,121,929.

—

Extra 2 Per Cent. Firestone Dividend

AKRON, O., Sept. 4—The Firestone Tire & Rubber Co. has declared a quarterly dividend of 3 per cent. and an extra dividend of 2 per cent. on the common stock; also a regular quarterly dividend of 1¾ per cent. on the preferred stock. All the dividends are payable October 15 to stock of record of October 1. The previous declaration on the common stock was 2½ per cent.

The common dividend represents an advance in the rate from 10 per cent. to 12 per cent. per annum. The extra dividend has not been declared heretofore.

The gross sales of the company, in the fiscal year ended July 31, 1914, exceeded $19,000,000 against $16,600,000 in the previous year, $11,500,000 in the fiscal year 1912, $7,500,000 in the 1911 year and $5,000,000 in the year ended July 31, 1910.

The company has $3,000,000 common and $1,000,000 preferred stock outstanding, so that earnings, which amount to approximately $3,000,000, are at the rate of nearly 100 per cent. on the common after the 7 per cent. cumulative dividends on the preferred stock.

Market Reports for the Week

This week's markets saw the usual changes. Tin dropped $2.75 per 100 pounds, the arrival of a large amount of that product at the Atlantic ports, having a depressing effect with a small demand from domestic consumers for spot and nearby positions. Copper underwent no material change last week. The demand for this product was light. It was reported that 3,520 tons of copper was exported from Atlantic ports for Europe. In the rubber market consumers are holding aloof from the market pending developments. It is reported that no further auctions will be held in London until after the close of the war.

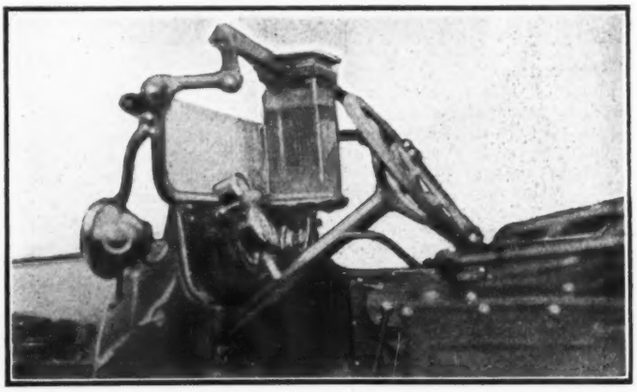
Material	Wed.	Thurs.	Fri.	Sat.	Mon.	Tues.	Week's Changes
Antimony	.11¼	.11¼	.11¼	.11¼	.11¼	.11¼	.....
Beams & Channels, 100 lbs.	1.31	1.31	1.31	1.31	1.31	1.31	.....
Bessemer Steel, ton	20.50	20.50	20.50	20.50	20.50	20.50	.....
Copper, Elec., lb.	.12	.12	.12	.12	.12	.12⅜10	+ .00⅜10
Copper, Lake, lb.	.12½	.12	.12	.12	.12	.12⅜	— .00⅛10
Cottonseed Oil, bbl.	6.15	6.20	6.02	6.02	6.02	5.85	— .30
Cyanide Potash, lb.	..	..	..	..	..	..	.....
Fish Oil, Menhaden, Brown	.40	.40	.40	.40	.40	.40	.....
Gasoline, Auto, bbl	.13	.13	.13	.13	.13	.13	.....
Lard Oil, prime	.93	.93	.93	.93	.93	.93	.....
Lead, 100 lbs.	3.87½	3.70	3.70	3.70	3.70	3.85	— .02½
Linseed Oil	.60	60	.60	.60	.60	.60	.....
Open-Hearth Steel, ton	20.50	20.50	20.50	20.50	20.50	20.50	.....
Petroleum, bbl., Kans., crude	.75	.75	.75	.75	.75	.75	.....
Petroleum, bbl., Pa., crude	1.45	1.45	1.45	1.45	1.45	1.45	.....
Rapeseed Oil, refined	.82	.82	.82	.82	.82	.82	.....
Rubber, Fine Up-River, Para	.77	.75	.75	.75	.75	.75	— .02
Sulphuric Acid, 60 Baume	.90	.90	.90	.90	.90	.90	.....
Tin, 100 lb.	37.50	37.00	36.00	36.00	36.00	34.75	—2.75
Tire Scrap	.05	.05	.05	.05	.05	.05	.....

1 Gallon Drives Chevrolet Roadster 27.9 Miles

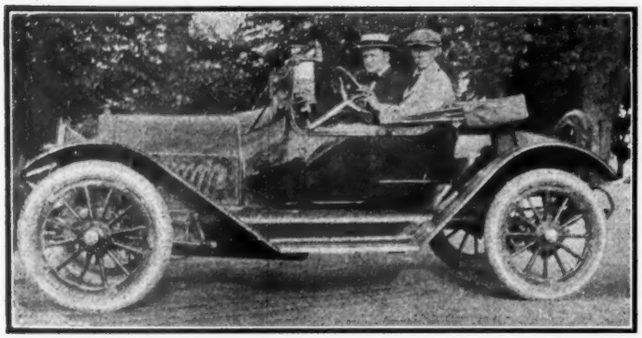
NEW YORK CITY, Sept. 3—A Royal Mail model Chevrolet roadster under test over the roads of Central Park in this city ran 27.9 miles on a measured gallon of gasoline. The car tested was a standard stock model taken from the Broadway sales room and fitted with regular equipment except that the generator was disconnected at the time of the test and the carbureter fitted a one inch Stromberg model-K with a 64 needle. A hot air attachment was fitted.

The test was observed by J. E. Schipper of THE AUTOMOBILE and was carried out under strictly touring conditions. The average speed maintained was 21.6 miles per hour. The brakes were used frequently owing to traffic conditions along the course which was all in Central Park, traveling north on the west drive, and south on the east drive. The carbureter was adjusted for service conditions and did not have the gasoline cut down any more than would be done on the average car. In fact on the same adjustment the car climbed the Abbey hill on direct drive at a minimum speed of 16 miles per hour. This is a gradient which averages approximately 8 per cent.

During the test, the car was declutched on the steeper hills allowing it to coast with the motor idling, and the interconnection which is generally used between the clutch and brake operating on the same pedal, was removed for coast-



Method of mounting graduated tank on Chevrolet test car



Fred Tucker, Stromberg company, left, and Paul Dean, Chevrolet company, driving Royal Mail Chevrolet used in economy test

ing freedom. The clutch slipped slightly when the car was quickly accelerated. The weight of the car complete with two passengers, was 2585 pounds. The tires were Goodyear, 30 by 3.5 Allweather, non-skid tread all around with the rear tires inflated to 70 pounds and the front to 60 pounds. Gasoline was .71 Beaume at 60 degrees Fahrenheit. The odometer was a Stewart-Warner, checked by measurement around the circumference of the wheel. The gear ratio on direct was 4 to 1.

The Chevrolet, Model H-2, 4-cylinder engine used on the Royal Mail roadster, has its valves in the head. It has a bore of 3 11/16 inches and a stroke of 4 inches. In this instance the car was operated with the windshield in one-half position and the certified gallon measure was carried on a bracket on the top of the windshield. One gallon of fuel was placed in this, and after the gasoline in the connecting tube had been exhausted the car was run until it stopped through lack of fuel.

July Exports from New York Decrease $249,915

NEW YORK CITY, Sept. 5.—Exports of automobiles, commercial vehicles and their parts from the port of New York during the month of July amounted to $947,147, against $1,197,062 for July, 1913, a drop of $249,915.

The imports for July, 1914, amounted to $116,837, as compared with $82,133 for that month in 1913, a gain of $34,704.

June exports were a little higher than those of July, amounting to $1,399,125, or a gain of $451,978. The imports during that month amounted to $108,579, or $26,446 lower than July.

The total figures for the month of August have not been completed as yet. The following figures will give the number of cars and commercial vehicles exported and imported during June and July of 1913 and 1914:

JULY EXPORTS

	1914		1913	
	No.	Value	No.	Value
Cars	840	$638,452	1,183	$1,037,680
Trucks	32	72,102	12	18,344
Parts	..	236,593	..	141,038
Total		$947,147		$1,197,062

JULY IMPORTS

	1914		1913	
	No.	Value	No.	Value
Cars	9	$17,384	30	$71,543
Parts	..	99,453	..	10,590
Total		$116,837		$83,133

Bakelite Commutator Breaks at 9,060 Revolutions

AN interesting test on the new Bakelite commutator recently adopted by the United States Light & Heating Co. of Niagara Falls, N. Y., has just been completed in the laboratories of this concern. The method by which the test was made was one which served to show a comparative value of the Bakelite moulded insulation as compared with those used previously.

Stress Equal to 15,230 Pounds

The commutator with the improved type of insulation was speeded up to 9,060 revolutions per minute, or 24,600 feet per minute peripheral speed before going to pieces. The chief engineer of this department of the U. S. L. company states that the disrupting forces at this speed figured out to 15,230 pounds at which point the commutator failed by centrifugal strains. As the maximum speed at which such a commutator would be operated in service is only 3,500 revolutions per minute, the factor of safety in the above instance would be 6.7 since the centrifugal force tending to break the commutator varies as the square of the speed.

Made to Stand 10,000 R.P.M.

It is interesting to compare this test with previous ones made by this company on commutators made up of brass and steel rings with mica between the rings and bars. While these constructions prove to be strong enough in practice, the brass commutator went to pieces at 6,000 revolutions per minute, while the steel commutator would stand only approximately 8,000.

Minor alterations made in the design of the new Bakelite commutator have resulted in an increase of strength so that the engineers of the U. S. L. company are of the opinion that these commutators will not stand the stresses imposed upon them at 10,000 revolutions per minute.

The commutator tested is shown in the accompanying illustrations. A part sectional view is given in Fig. 1, showing the construction of the copper segments with the steel rings and the Bakelite insulations. This type of commutator when complete weighs 8.6 pounds and has an outside diameter over the forks of 13.375 inches. When tested the forks were removed, leaving a net weight of 7.06 pounds and an outside diameter of 10.375 inches. This is the diameter at the commutator face.

Tested Under Service Conditions

In order that the commutator while being tested would approach service conditions at the temperature, it was heated to 265 degrees Fahrenheit before testing. This temperature is many degrees more than would occur in practice. In working out the calculations showing that the disrupting force amounted, as stated, to 15,230 pounds, or about 7 tons per square inch, it was shown that since this was resisted by the tensile strength of the steel rings and the Bakelite, the holding power of these components of the commutator is evidently equal to this figure.

It is stated that in addition to having the high tensile strength for commutator insulation, that Bakelite possesses the important qualification of having a high dielectric strength. That is, it resists electricity to a high degree. It will not soften under heat up to at least 400 degrees Fahrenheit and is impervious to oil and moisture.

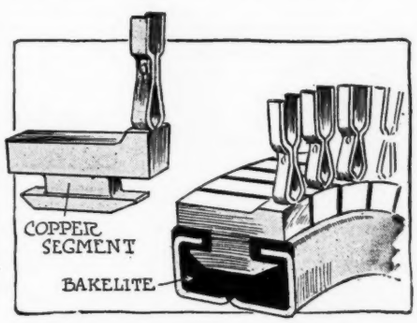


Fig. 1—Section through the Bakelite commutator adopted by the U. S. Light and Heating Co.

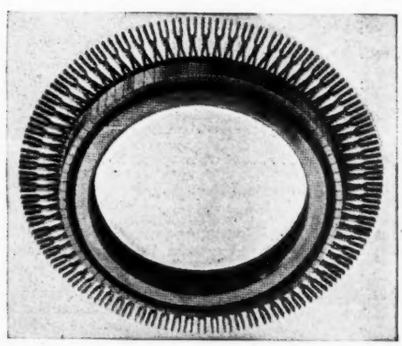


Fig. 2—Assembled view of the complete comutator recently tested up to a speed of 9,000 revolutions per minute

Factory Miscellany

GEAR Co. Working Overtime.—The New Process Gear Corp., Syracuse, N. Y., reports that it is working overtime to keep up with a volume of business larger than any heretofore handled. An additional building is now being erected, and the capacity of the case-hardening and heat-treating departments are again being doubled. The total production of the plan in spur, spiral and bevel metal gears and New Process noiseless gears and pinions will, after January 1, 1915, be in excess of 1,000,000 per year. A large part of this output is already contracted for.

Wants Factory Equipment—J. A. Hill, Essex, Ont., is ready to purchase the equipment for a factory to manufacture cycle cars.

Covert to Erect—Covert Motor Vehicle Co., Lockport, N. Y., will erect a $50,000 addition as soon as switching facilities can be adjusted.

Canadian Top Will Enlarge—The Canadian Top Co., Tilbury, Ont., manufacturer of automobile tops, contemplates enlarging its present plant.

McQuay-Norris Moves—The McQuay-Norris Mfg. Co., St. Louis, Mo., manufacturers of leakproof piston rings, has removed into its new quarters, 2208 Locust street.

Tire Plant in New Orleans—The York Co-operative Tire & Rubber Co., New Orleans, La., plans to erect a tire manufacturing plant. Leslie Dunnis is president and W. Cooke, vice-president.

Radiator Plant for Jamestown—Jamestown, N. Y., men, headed by John Gabrielson, have chartered the Gabrielson Car Parts Manufacturing Co., with $35,000 capital, and will build a plant at Jamestown to manufacture automobile radiators.

Splitdorf Ready for All Orders—The Splitdorf Electrical Co., Newark, N. J., states that it is ready to fill all orders for ignition units. All the units of its output are made in America and it has sufficient raw material on hand to effect all deliveries.

Avon Tire Co. Increasing—The Avon Tire Co., Lynn, Mass., has secured the buildings formerly used by the Sagamore Rubber Co., East Saugus, and has moved into them, increasing its force to more than 200, which is turning out solid tires that have a good sale.

Lambert Co.'s New Plant—The Lambert Mfg. Co., Anderson, Ind., has acquired a 6-acre site at El Segundo, Cal., and will erect a plant for the manufacture of motor tractors. The plant will be 60 by 200 feet. S. J. Smith is manager and J. W. Lambert, president.

Auto Products May Move—The Board of Trade has succeeded in negotiations whereby the Auto Products Co., Canton, O., will remove to Canal Dover, O., as soon as $20,000 worth of 7 per cent. preferred stock can be sold. It is planned to begin operations within 60 days as soon as negotiations are completed.

Want Plant in Neenah—The Neenah (Wis.) Advancement Assn. is in negotiation with the Rayfield Cyclecar Co., Christman, Ill., with a view to inducing the removal of the plant to Neenah. The Rayfield people are asking that Neenah capital subscribe to $20,000 worth of its stock.

Cooking Outfits for Automobiles—A factory for the production of cooking outfits designed especially for motorists is being established in the former Reliance Engine Co.'s foundry at Racine, Wis., by John Dean and G. M. Prentiss, who have secured ample financial backing to organize a $50,000 corporation for this purpose.

Rhineland's French Factory Running—The Societe Francaise des Roulements a Billes, Ivry Port, Paris, France, the foreign plant of the Rhineland Machine Works Co., New Britain, Conn., is running. The American factory, the Fafnir Bearing Co., New Britain, is running full force, and has a supply of imported steel and balls to last for many months.

Dayton Cyclecar Plant in Joliet—The Dayton Cyclecar Co. of Ohio has concluded negotiations for the opening of a branch factory in Joliet, Ill. It is planned to construct 3,000 of these cars during the coming year. Thomas Donovan, representing the Dayton company, has been in Joliet for several davs conferring with the Chamber of Commerce regarding suitable quarters.

Standard Welding's Big Rim Contracts—Rim contracts secured so far this season by the Standard Welding Co., Cleveland, O., indicate that more than 150,000 automobiles of the 1915 stamp will have Stanweld detachable or demountable rim equipment. And this quantity does not include the plain clincher type rims, of which the Standard company manufactures approximately one and a half million a year.

Maxwell's Memphis Branch Plant—The Maxwell Motor Co., Detroit, plans to establish a branch plant at Memphis, Tenn. It will be used for manufacturing light parts and for assembling work. A considerable amount of machinery will be needed. The building will be six stories, and with its equipment will cost $200,000. A site has already been leased. Vice-president Charles Gould is in charge of locating the branch, which will serve the Southern and Southwestern trade.

The Automobile Calendar

Sept. 7-14	Hartford, Conn., Show, Charter Oak Park.
Sept. 7-14	Indianapolis, Ind., Automobile Show, Indianapolis Automobile Trade Assn.
Sept. 9-11	Convention Paving Brick Mfrs. Assn., Cleveland, O.
Sept. 10..	Portsmouth, Eng., Autumn Conference, Institute of Metals.
Sept. 12	Hamline, Minn., Track Meet, Minn. State Fair.
Sept. 15-16	Norfolk, Neb., Track Race, Norfolk Commercial Club.
Sept. 15-Oct. 11	New York City, Commercial Tercentenary Celebration.
Sept. 23-Oct. 3	Oklahoma City, Okla., Show, Oklahoma Automobile Association.
Sept. 26	Kalamazoo, Mich., 100-Mile Track, Inter-State Fair.
Sept. 27	Pleasanton, Cal., Track Meet, Alameda County Fair Assn.
Oct. 3-10	Cincinnati, O., Show.
Oct. 3	Fresno, Cal., Track Meet, Fresno Co. Agricultural Assn.
Oct. 4	St. Louis, Mo., Automobile Show, Auto Manufacturers' and Dealers' Assn.
Oct. 5-12	St. Louis, Mo., Show, Forest Park Highlands.
Oct. 7-17	New York City Electric Vehicle Show, Grand Central Palace.
Oct. 10	Medford, Mass., Track for Light Cars, Combination Park.
Oct. 10-17	Boston, Mass., New England Light Car and Cyclecar Show, Horticultural Hall.
Oct. 17-24	Pittsburgh, Pa., Automobile Show, Auto Dealers Assn., Inc.
Oct. 17-Nov. 1	Dallas, Tex., Show, State Fair Grounds, Dallas Automobile Dealers' Assn.
Oct. 19, 20, 21	Philadelphia, Pa., Elec. Veh. Assn.'s Convention.
Oct. 19-26	Atlanta, Ga., American Road Congress of the American Highway Assn. and the A. A. A.
Oct. 28-31	Milwaukee, Wis., Convention, Northwestern Road Congress, Auditorium.
Nov.	El Paso, Tex., Phoenix Road Race, El Paso Auto Club.
Nov. 8-9	El Paso to Phoenix, Ariz., Automobile Race.
Nov. 8-11	Shreveport, La., Track Meet, Shreveport Auto Club.
Nov. 26	Corona, Cal., Road Race, Corona Auto Assn.
Dec. 1-4	New York City, Annual Meeting of the American Society of Mechanical Engineers.
Jan. 2-9	New York City, Annual Automobile Show, Grand Central Palace.
Jan. 3-10	Buenos-Aires, Argentina, Grand Prize of Argentina.
Jan. 9-16	Philadelphia Automobile Show.
Jan. 23-30	Chicago, Ill., Automobile Show, First Regiment Armory.
Jan. 30-Feb. 6	Minneapolis, Minn., Show, National Guard Armory, Minneapolis Automobile Trade Assn.
Mar. 7	San Francisco, Cal., Panama-Pacific Exposition, Grand Prize Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.
Mar. 14	San Francisco, Cal., Panama-Pacific Cup Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.
Feb. 22	San Francisco, Cal., Vanderbilt Cup Race, Panama-Pacific Exposition Grounds; Promoter, Panama-Pacific Exposition Co.

The Week in  the Industry

Motor Men in New Roles

MORGAN FORD'S Newark Booster—Gaston Plaintiff, the New York City manager for the Ford Motor Co., has arranged with W. J. Morgan to become connected with the Newark, N. J., branch as a sort of general booster, his principal work being in the sales department and also in local publicity.

Eib Frisco Oakland Manager—C. C. Eib will hereafter control the sales of the Oakland car in San Francisco.

Johnston Sales Manager—J. E. Johnston has been named sales manager for the Hennepin Truck Sales Garage, Minneapolis, Minn.

Haskins Branch Manager—C. B. Haskins has been appointed branch manager of the Walker-Bin Co., 239 Michigan avenue, Detroit, Mich.

Landman Sales Manager—A. E. Landman has been appointed sales manager for the Don Lee Co. in Los Angeles, distributor of Cadillac cars.

Dowse with Kelly-Springfield Tire—R. P. Dowse, who was general sales representative of the Goodyear Tire & Rubber Co., Detroit, Mich., is now with the Kelly-Springfield Tire Co., Akron, O.

Lay Joins Dodge Bros.—R. P. Lay, assistant chief engineer of the H. H. Franklin Mfg. Co., Syracuse, N. Y., has resigned his position and September 1 took up his duties with Dodge Bros., Detroit, Mich.

Clough Resigns—C. Roy Clough has resigned as manager of the Brasher Motor Car Co., Columbus, O., to accept a position as sales manager with the Broad-Oak Automobile Co., also of Columbus.

Stewart Abbott Sales Manager—C. D. Stewart has been appointed sales manager of the Abbott Motor Co., Detroit, Mich. He was formerly the Abbott company's branch manager in Harrisburg, Pa.

Moore Resigns from J.-M.—F. L. Moore has resigned as city sales manager for the Indianapolis sales branch of the H. W. Johns-Manville Co., to take a similar position in that city with the Lyons-Atlas Co.

Myers Connects with Cole—W. D. Myers has become associated with the sales department of the Cole Motor Car Co., Indianapolis, Ind. Until recently Mr. Myers was general sales manager for the Stutz Motor Car Co.

Earle Lozier Wholesale Representative—R. D. Earle, who formerly was head of the American Automobile Co., Philadelphia, Pa., has become associated with Harry S. Houpt, Inc., 250 North Broad street, the local Lozier agency, in the role of wholesale representative.

Everitt Hayes Body Manager—The Hayes Mfg. Co., Detroit, Mich., announces that B. F. Everitt has been appointed manager of its body building department. Mr. Everitt is well known in the automobile trade having been connected with the E-M-F, Wayne and Everitt automobile companies.

Packwood Briggs-Detroiter Sales Manager—F. B. Packwood, formerly in business in Lincoln, Neb., where he was distributor for the E-M-F, Everitt, Krit and Winton cars, has been appointed western sales manager of the Briggs-Detroiter Co., Detroit, Mich., with headquarters in Lincoln.

Williams Resigns from Franklin.—W. M. Williams, who for the past 2 years has been advertising manager of the Franklin Automobile Co., Syracuse, N. Y., has resigned his position and leaves the automobile field. He became identified with the International Liberty Union of Covington, Ky., on September 1.

Sutton Succeeds Packham—N. F. Sutton, for almost a year a member of the sales force of the General Motor Truck Co., has been promoted to the managership of the St. Louis (Mo.) branch. Mr. Sutton, who previously was connected with the Mitchell branch at Dallas, Tex., succeeds C. M. Packham, resigned.

Burns Joins Providence Co.—J. E. Burns, formerly manager of the Lee Motor Car & Supply Co., New Bedford, Mass., and later factory branch representative for the Jackson cars in Boston, has become identified with the Davis Automobile Co., Providence, R. I., which recently took the agency for the Regal cars.

Flagg Joins Standard Welding—Howard A. Flagg has become associated with the selling forces of the Standard Welding Co., Cleveland, O. Mr. Flagg has been connected with the seamless tubing industry for the past 15 years. At one time Mr. Flagg was sales manager of the steel tubing department of the Standard Welding Co.

Motsinger Rayfield Representative—N. H. Motsinger, Jr., is the latest addition to the Rayfield Carburetor organization. He formerly represented the Schebler Co. in Chicago, being Chicago branch manager for a number of years. Mr. Motsinger will serve the Findeisen & Kropf Mfg. Co., Chicago, Ill., in the capacity of factory representative.

Recent Changes in Seattle—Numerous changes have recently been made in the force of the Waterhouse-Sands Motor Co., Seattle, Wash. Earl Staley will hereafter be superintendent of the mechanical department, Will Culberson assistant to Mr. Sands in charge of the office. A. B. DeCasteline has recently joined the sales staff of the Gerlinger Motor Car Co., Seattle, taking charge of the Oldsmobile sales.

Winchell Retires—E. R. Winchell, well known Portland, Ore., dealer and formerly at the head of the Oregon Motor Car Co., has decided to retire from the automobile business in Portland. Mr. Winchell has sold his share to his associates, F. C. Riggs and W. C. Garbe. The management of the business will be under the supervision of W. C. Garbe, assisted by D. C. Warren. Mr. Winchell will tour through Oregon and California before announcing his plans.

Henshaw Gets Dodge in Boston—The uncertainty relative to the agency for the Dodge car in Boston was settled last week when the announcement was made that Charles S. Henshaw was to market the car. He has been in the motor industry since 1890, and a few years ago was manager of the E. R. Thomas branch in New York, going from there to the Alvan T. Fuller Co, Boston, to sell Packards. He has formed a company and will begin business October 1.

Tway Heads Haynes Branch—The Haynes Automobile Co., Kokomo, Ind., has opened a branch in Birmingham, Ala., at 400 South 21st street, in charge of Charles W. Tway and D. B. Williams, as assistant manager. From this branch all the business in the states south of the Ohio River and the West Indies is now being looked after or controlled. Here will be the headquarters of the traveling men and service mechanics for the entire territory controlled by the branch.

Join Studebaker Staff—To link more closely the factory sales organization with its force in the field, Sales Manager Ollier of the Studebaker Corp., has appointed the following staff of special representatives: New England, G. N. Jordon; South Atlantic, Edward A. Haybell; Central West, J. M. Opper; Southwest, L. A. Tilley; Pacific Coast, B. O. Willebrands. D. R. Murrell and R. C. Bridge have been promoted to be district representatives with headquarters at Norfolk, Va., and Salt Lake City, respectively.

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Garage and Dealers' Field

"Sleuth" Looks for Bad Tires—"Follow Up" as it may be applied to the automobile tire business is demonstrated by a firm of dealers in Birmingham, Ala. This company sends a scout about town to note when any of the Ajax tires, which it handles, are showing signs of being worn so that a new casing is likely soon to be necessary. From his reports solicitation of business follows by telephone, call and letter.

Banquet for Maxwell Dealers—Dealers in the Maxwell in Ohio were given a banquet at the Southern Hotel, Columbus, August 28 as the guests of the company. The company was represented at the dinner by L. S. Smith, manager of sales in central Ohio; John G. Paine, manager of sales in northern Ohio, and W. D. Paine, supervisor of sales in the East. W. D. Paine acted as toastmaster. One of the features of the banquet was a moving picture show entitled "From Molten Steel to Automobile."

Hupmobile Makes Good Run—The Messrs. Card & Brown, of the Central Iowa Motors Co., which handles the Hupmobile in Des Moines, Ia., made a rather fast trip in their 1915 demonstrator from Detroit to this city. Leaving the Michigan automobile metropolis at nine o'clock Wednesday morning of last week, they reached that city at 9:37 p. m. on Friday, having covered a distance of 760 miles in 29 hours. The car consumed, all told, 2½ gallons cylinder oil and averaged 19¼ miles to the gallon of gasoline.

Automobile Agencies Recently Established

PASSENGER CARS

Arkansas

Malvern	Maxwell	J. W. Alexander

California

Leemors	Haynes	Valley Garage
Stockton	Haynes	White Garage
Vallejo	Haynes	Acme Garage, Inc.

Canada

Berlin, Ont	Regal	E. L. C. Browne
Mildmay, Ont	Regal	Geo. Kuneman
Port Arthur, Ont	Saxon	Central Garage
Sault Ste. Marie, Ont	Regal	G. P. Black
Toronto, Ont	Regal	Regal Motor Sales Co.

Colorado

Denver	Apperson	Wm. Thorney Auto Co.
Denver	Dodge	Tom Botterill
Denver	Regal	Mid-West Auto Sales Co.

Connecticut

Danville	R-C-H	John P. Agan
E. Norwalk	R-C-H	Reddy & Ayers

Delaware

Wilmington	Haynes	Delaware-Touraine Co.

District of Columbia

Washington	Haynes	Briscoe Sales Co.

Florida

Tampa	Regal	E. E. Cone

Georgia

Atlanta	Haynes	Pegram Motor Co.
Macon	Haynes	Geo. R. Napier
Savannah	Haynes	Arthur H. Hadden

Illinois

Albany	Saxon	J. W. Dineen
Johnson City	Saxon	Colp Mercantile Co.
Olney	Saxon	Auto Supply Co.
Peoria	Haynes	Automobile Exchange of Peoria
Pontiac	Haynes	J. P. Cook & Co.
Princeton	Haynes	Alpaugh Bros.
Ramsey	Haynes	L. F. Strobel

Indiana

Angola	Haynes	Hendry & Elston
Portland	Haynes	Fred Foltz
Redkey	Saxon	Redkey Garage
Valparaiso	Haynes	Wheeler Elam Co.

Iowa

Clinton	Saxon	Andrew Payson
Clinton	Saxon	Saxon Motor Co.
Clinton	Vulcan	Andrew Payson
Corydon	Haynes	Wayne County Auto Co.
Des Moines	R-C-H	Holsman Sales Co.
Des Moines	Regal	Means Automobile Co.
Grinnell	Haynes	W. P. Watson

Kansas

Wichita	Regal	Regal Motor Co.

Massachusetts

Boston	R-C-H	D. Houston
Meridian	Haynes	John H. Semmes Motor Co.
Northampton	R-C-H	T. J. Collins

Michigan

Detroit	Detroiter	The McKenney-Devlin Co.
Detroit	Monarch	Owen-Schoeneck Co.
Detroit	R-C-H	E. W. K'Burg
Howell	Buick	C. B. Atkin
Jackson	R-C-H	Weber Bros.
Marquette	Regal	Asire & Palmer
Traverse City	Regal	S. O. Sawyer

Minnesota

Minneapolis	R-C-H	Choate Auto Co.
Minneapolis	Regal	Regal Motor Co.

Missouri

Kansas City	Chandler	The Chander Six Co.
Springfield	Regal	Sam Herrick & Son
St. Louis	Davis	The Cherokee Auto Co.
St. Louis	Wagenhals	Wagenhals Motor Co.

Montana

Anaconda	Regal	Frank M. Osborne
Bridger	Haynes	Dowdle & Hough
Glendive	Saxon	David Leidehl

Nebraska

Fremont	Haynes	Leslie L. Whitcomb
Schuyler	Haynes	Douglas Grotluschen

New Jersey

Elizabeth	R-C-H	Franklin Auto Co.
Swedesboro	Haynes	H. F. Hunter

New York

Albany	Hupmobile	The Stutz Auto. Co.
Buffalo	R-C-H	Geo. C. Barone
Fulton	R-C-H	Geo. M. Ives
Rochester	R-C-H	A. V. Hart
Watertown	R-C-H	A. E. Lawyer

North Carolina

Kinston	Saxon	Kinston Garage

Ohio

Archbold	Haynes	Haynes Auto Sales Co.
Bellefontaine	Saxon	Hornsberger Garage
Cedarville	Allen	Magley Bros.
Cleveland	Hupmobile	The Richardson Motor Car Co.
Columbus	Cadillac	Curtin-Williams Auto Co.
Columbus	Chalmers	Broad-Oak Automobile Co.
Columbus	Crescent	Craighead Motor Sales Co.
Columbus	Detroit	F. E. Avery & Son
Columbus	Empire	S. W. Schott
Columbus	Mitchell	G. E. Thomas Co.
Columbus	Packard	F. E. Avery & Son
Columbus	Pierce-Arrow	Broad-Oak Automobile Co.
Columbus	Oakland	Oscar Lear Motor Co.
Columbus	Saxon	Broad-Oak Automobile Co.
Convoy	Saxon	W. G. Campbell
Marietta	Ford	The Marietta Motor Car Co.
Spencerville	Haynes	American Motor Sales Co.
Springfield	Allen	The Eaton Motor Service Co.
Toledo	Haynes	Wm. Wheaton
Toledo	R-C-H	E. W. K'Burg

Oklahoma

Blackwell	R-C-H	J. D. Winfield
Hinton	Regal	Jas. A. Knox

Pennsylvania

Easton	Haynes	Keifer & Steele Motor Co.
Philadelphia	Hupmobile	Tioga Auto Co.
Philadelphia	R-C-H	Colonial Motor Co.

Rhode Island

Providence	Elk-Hart	A. O. Poirier
Providence	Cole	Cole Motor Sales Co.

South Carolina

Abbeville	Cole	A. M. Stone
Charleston	Cole	King Auto & Repair Co.
Clio	Cole	T.G.Covington Auto Co.
Columbia	Haynes	The Haynes Motor Car Co.

South Dakota

Fargo	Kissel	Ball Auto Co.

Tennessee

Nashville	Buick	Nashville Motor Car Co
Nashville	Overland	Union Motor Car Co
Nashville	Ford	Hartsfield Auto Co.
Nashville	Ford	Mitchell Burton
Nashville	Mitchell	Burton Auto Co.

Texas

San Antonio	Studebaker	Collins-Clem Auto Co

Virginia

Clifton Forge	Haynes	W. G. Mathews
Fredericksburg	Saxon	W. A. Richards, Jr.
Gig	Haynes	Chas. J. Hitchens
Harrisburg	Haynes	Kavanaugh Garage
Monterey	Haynes	Kyle Garage Co.

Washington

Dayton	Haynes	W. K. Bloome
North Yakima	Haynes	Central Auto & Supply Co.
Spokane	Chevrolet	Moylan-Reilly Auto Co.
Spokane	Elk-Hart	The Ward Symington Co
Walla Walla	Haynes	G. G. Sohneller

West Virginia

Charleston	Haynes	Wm. Hoferer & Son
Huntington	Haynes	Walter L. Robinson
McMechen	Alter	W. R. Baumberger
Newburg	R-C-H	J. T. Logsdon
New Cumberland	Regal	Scott Bros.
Princeton	Haynes	Princeton Motor Garage Co.
Wheeling	Overland	The Auto Sales Co.

Wisconsin

Green Bay	Cole	Washington Garage
Milwaukee	King	The Schreiber-Boorse Motor Car Co.
Milwaukee	Regal	Regal Motor Co.
New London	R-C-H	New London Hardware Co.
Prairie du Chien	Saxon	Harris Auto Co.
Seymour	Saxon	Otto Motor Co.
Sheboygan	Cole	The Struebing Garage

COMMERCIAL VEHICLES

Alabama

Gadsden	Koehler	Etowah Warehouse Co
Montgomery	Koehler	Patterson & Ingalls

Connecticut

Hartford	Selden	Keeney Garage Co.
Hartford	Vim	Keeney Garage Co.

New York

Bergen	Koehler	Geo. E. Parish

Ohio

Wooster	Koehler	Rice & Wacker

Pennsylvania

Philadelphia	Flint	D. Walter Harper

South Carolina

Honea Path	Koehler	McKenzie & Monroe

Texas

Austin	Koehler	S. E. Kinney
Belvidere	Koehler	Harry Searles
Dallas	Koehler	W. T. Keaton
San Antonio	Koehler	C. H. Dean

Recent Incorporations in the Automobile Field

AUTOMOBILES AND PARTS

Connecticut

HARTFORD—Colonial Auto Co.; capital, $20,000; to deal in motor cars. Corporators: William M. and Hazel O. Turnbull, both of Hartford; David A. Turnbull, Willimantic.

NORWALK—Norwalk Supply Show; capital, $5,000; to deal in motor cars. Corporators: John A. and Sarah L. Mills and M. A. Gregory, all of Norwalk.

Illinois

CHICAGO—Ideal Automobile Co.; capital, $1,000; to manufacture and deal in machinery, motor car parts and accessories. Corporators: Archie A. Gross, S. Abrahamson, Arthur C. Dunning and Leonard L. Cowan.

Indiana

JEFFERSONVILLE—Jeffersonville Motor Car Co.; capital, $10,000; general motor car business. Corporators: Don Williams, Fred D. Deitrich, William Kilgus and others.

Massachusetts

HAVERHILL—Renton Motor Car Co.; capital, $2,000; to deal in motor cars. Corporators: Lester T. Wolff, Ralph W. Benton and Francis W. Johnson.

New York

NEW YORK—Arthur J. Myers; capital, $3,000; motor car business. Corporators: Harold M. Greenbaum, William P. Roley and Augusta E. Eubin, all of 2 Rector street.

NEW YORK—Taft-Rich Auto Co.; capital, $10,000. Corporators: Roland Richensteen and Royal R. Richensteen, both of Rockville Center, and Augusta Taft, 44 Ely avenue, Long Island City.

Ohio

CINCINNATI—Cincinnati Automobile Dealers; capital, $2,500. Corporators: Harry C. Brunton, Edgar A. Kruse and Frank H. Miller.

TOLEDO—Toledo Cadillac Co.; capital, $20,000; motor cars and accessories. Corporators—T. H. Towell, William H. Marlott, R. G. Morrison, F. H. Pelton and J. B. Wood.

Pennsylvania

SCRANTON—Scranton Automobile Co.; capital, $100,000; to manufacture motor cars. Corporators: H. R. Shaw, T. Prevost and L. G. Stark, all of Scranton.

GARAGES AND ACCESSORIES

Massachusetts

BOSTON—International Sales Organization; capital, $50,000; motor car supplies, metal polishes and general manufacturing business. Corporators: L. Taylor and R. Taylor, both of Stamford, Conn.; E. W. Brown, Boston.

New York

ROCHESTER—J. Lawrence Hill Co.; capital, $10,000; to deal in storage batteries. Corporators: J Lawrence Hill, J. Jaffrey and J. Hill.

Ohio

CLEVELAND—Limou Curtain & Equipment Co.; capital, $1,000; to deal in Limou curtains and motor car accessories. Corporators: A. P. Fischley, Beatrice B. Fischley, C. Albracht, Jessie L. Albracht and C. M. White.

CHANGE OF NAME AND CAPITAL

Michigan

DETROIT—Scripps-Booth Co., from $50,000 to $100,000.

Ohio

TOLEDO—Willys-Overland Co., from $25,000,000 to $50,000,000.

Wisconsin

MILWAUKEE—Bugett & Co., from $15,000 to $25,000.

MILWAUKEE—Stanley Steamer Co. to Bugett & Co.

Accessories for the Automobilist

UNIVERSAL Piston Valve Motor—A new type of piston valve motor, Figs. 1 and 2, in which the valves open and close very quickly and with absolute silence, is announced by the Universal Mfg. Co., Minneapolis, Minn. In other respects the motor is like any conventional poppet valve design. It is an L-head type with block cast cylinders. The valves are operated by the connecting-rod and crank mechanism shown. The quick opening is obtained by the peculiar curve of the member that engages the valve crankshaft.

The construction calls for the intake and exhaust headers being placed on the top of the motor, as shown, the high position of the intake manifold giving a very accessible carbureter location, and there is no chance for missing, caused by condensation, to occur.

In this engine the intake valve opens 5 degrees after top dead center and closes 45 degrees after bottom dead center. The exhaust valve opens 35 degrees before top dead center and closes 10 degrees after top dead center. The quick opening and closing of the valve give added power for the weight, it is claimed, and the small percentage of power absorbed by the valves and the valve mechanism is said to make the engine desirable for motor car service. It is a simple motor from a manufacturing point of view and can be fitted with almost any type of ignition. In the lubrication of this motor there are two reservoirs, one for the valve mechanism and the valves and the other for the remaining parts. Splash is employed throughout and when the valve oil supply rises too high there is provided an outlet into the main motor reservoir.

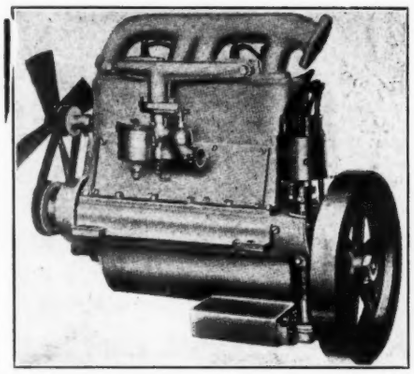


Fig. 1—Universal piston-valve motor

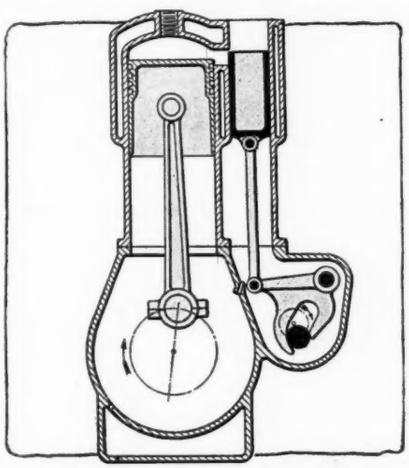


Fig. 2—Section through Universal motor

New Air Starter—An air cranking system, Figs. 3 and 4, which is somewhat similar in its general operation to the units of an electric starting and lighting system has just been brought out by the Auto Air Appliance Co., Baltimore, Md. Its operation is like that of an electric system in so far as it generates its own power in the form of compressed air, while the gasoline engine is running and later uses this stored energy to crank the engine. It consists essentially of a four-cylinder compressor-motor connected by silent chain to the engine crankshaft, this compressor pumping air to a tank. When desired for starting the air from the tank is sent back through the compressor, which turns over the engine. The entire apparatus necessary for this installation consists of the compressor, which is 12 inches long, 9 inches high and 5½ inches wide; a storage tank, 42 inches long; gauge, valves and an automatic governor for controlling the flow of air to and from the compressor, its functions being analogous to that of an automatic cutout in an electric-lighting system.

Fig. 4 shows the arrangement of the parts when installed. It will be seen that the compressor-motor is attached to the crankshaft of the engine by chain, and from the compressor lead two pipes, both terminating in the storage tank. One pipe sends air to the tank and the other is a feed pipe for air from the tank to the compressor. When the gasoline engine is started the compressor starts pumping air to the tank to a predetermined maximum pressure, and when this pressure is reached an automatic governor disengages the compressor clutch, thereby stopping further flow of air to the tank. When the pressure in the storage tank drops to a predetermined minimum the compressor again starts sending air to the tank. This arrangement then is similar to electric starting systems in which an automatic cutout is used for connecting and disconnecting the generator from the battery circuit, only in this case a governor disconnects and connects the compressor to the air line.

In order to crank an engine with this device it is necessary only to press the starting button shown in the illustration, this operation admitting air to the four-cylinder compressor, and the compressor, being connected with the engine crankshaft, turns it over, but the moment the pressure on the button is released the compressor ceases to be a motor and starts pumping air to the storage tank. The release of the starting button puts the governor in operation to perform this function.

When acting as a compressor, only two of the four cylinders are in use, and according to a statement from the company, the tank can be filled with air to a maximum pressure of 250 pounds in 5 minutes if the car is operating at a speed of 30 miles per hour. This is decreased to 15 minutes should the car be traveling 10 miles per hour. A test by the maker has shown that with air at 235 pounds pressure in the tank a 30-horsepower engine can be started thirty-five times without exhausting the tank. The turning speed of the gasoline motor is 200 r.p.m.

The compressor-motor is built like an ordinary gas engine. The cylinders, pistons, rings, etc., are iron castings, the crankcase aluminum and the connecting-rods drop-forgings. Oiling is by splash.

It is obvious that with a storage tank

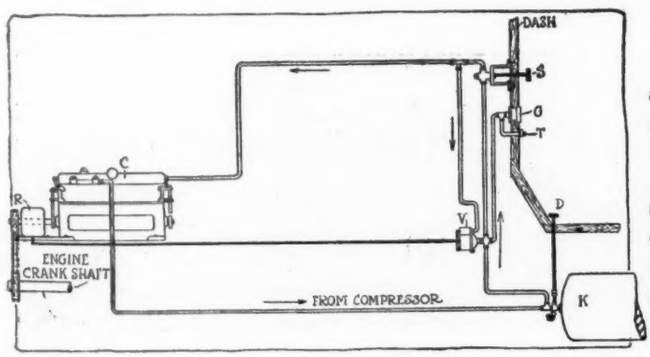
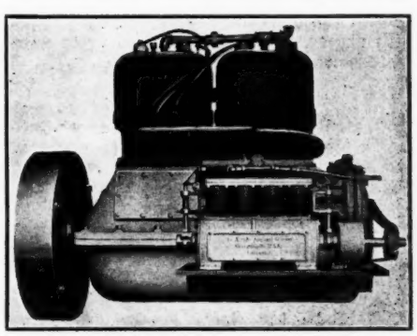


Fig. 3 — Right—Auto air appliance starter attached to motor

Fig. 4—Left—Starter piping layout, showing connection to motor and tank, and dash control



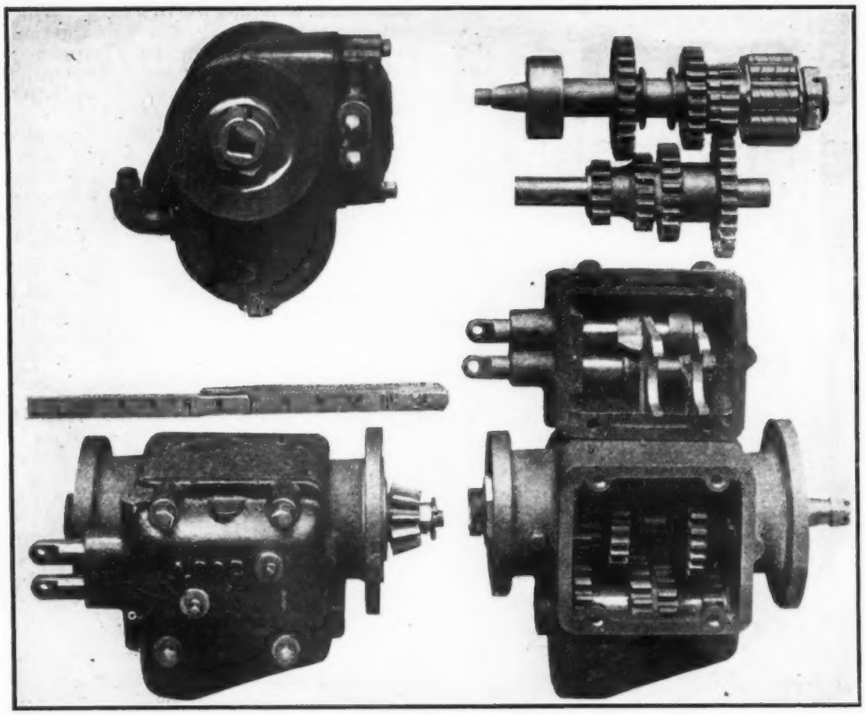


Fig. 5—Northern small car gearset. This model is for attachment to the rear axle. Another type is made for unit power plant constructions

with 250 pounds air pressure, some of this can be used for purposes other than cranking, and the device just described uses surplus air for inflating tires and for cleaning.

Northern Small Car Gearsets—Two types of three-speed sliding gearsets are manufactured by the Northern Engineering Works, Detroit, Mich., for small cars. From 12 to 18 horsepower can be transmitted. One is for attachment to the rear axle and the other is for use in connection with a unit power plant construction. The former is shown in Fig. 5.

With the exception of the details noted both gearsets are identical. The gears have ⅝-inch face, seven to nine pitch and all the principal gears are cut from 3.5 per cent. At the front, Hyatt roller bearings are employed, while at the rear double-row ballbearing bearings are found. The case is made of cast iron, and the shifter rods are assembled in the cover, providing both accessibility and compactness. The ratio on second is 1.73 to 1, on low 2.98 to 1, and reverse 3.64 to 1.

Fowler Flex-Spring Shock Absorbers—A new type of shock absorber for Ford cars is indicated in the device illustrated in Fig. 6, and which is manufactured by the Fowler Lamp & Mfg. Co., 57 East 24th street, Chicago, Ill. The price complete with studs and grease cups is $8 per set.

Highway Tire Straps—To prevent skidding, tire wear, punctures and blow-outs, a flexible leather and steel tire covering has been brought out by the Bukolt Mfg. Co., Stevens Point, Wis. The name of the device, Fig. 7, is Highway Tire Straps, because it consists of a series of straps linked together. The de ice may be easily and quickly removed when desired. The price for a 28 by 3 shoe is $8.80 and for a 38 by 5 $22.

Curtis Auto Trailer—The trailer shown in Fig. 8 is a two-wheeled device in which the springs are mounted on an underslung frame and in which a special form of hitching tree is used so that the trailer may be clamped to the back of any car. This device permits the car to turn at any angle and yet the trailer will follow directly in its track. The body is 41.5 inches wide and 7 feet 3 inches long. Its capacity is 1,000 pounds. The price with steel tires and 1,000-mile axle is $60; with rubber tires and 1,000-mile axle, $75, and with roller bearings and rubber tires, $90. It is manufactured by Alex R. Curtis, 1405 Hennepin avenue, Minneapolis, Minn.

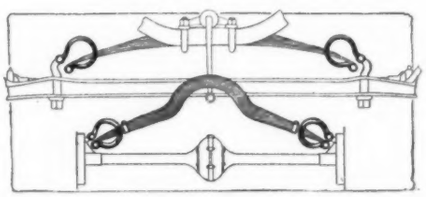


Fig. 6—Fowler Flex-Spring shock absorbers

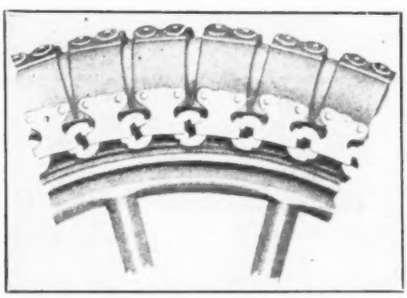


Fig. 7—Highway tire straps

Sheldon 3-Ton Axle—The 3-ton worm gear axles now being delivered by the Sheldon Axle Co., Wilkesbarre, Pa., follow the same general design of the previous models.

The worm is made of special heat-treated steel and ground by special machinery. The worm wheel is cut from special formula bronze and by special machinery for this work. The worm and worm wheel are carried in a worm carrier—a very substantial casting machined by special jigs and fixtures to receive the worm and worm wheel in perfect alignment. The methods employed in machining the worm carrier insures positive adjustment at all times and renders the assembly unit absolutely fool-proof.

Ball bearings are used throughout, giving the truck buyer a worm gear axle in which there is absolutely nothing to get out of alignment.

The top of the worm gear carrier is drilled and tapped for an eye bolt to facilitate the removal of this unit, which contains the worm, worm wheel, radial bearings, thrust bearings and differential bearings. The differential thrust bearings are mounted in the axle housing proper.

All differential gears and pinions are 3½ per cent. nickel steel, heat treated. The differential spider is drop-forged and 3½ per cent. nickel steel, heat treated and ground to size.

The axle shafts are 3½ per cent. nickel steel, heat treated, and accurately proportioned to insure uniform stresses throughout.

Special attention has been given the subject of brakes on this axle, with the idea of securing the proper brake area, and at the same time using 36-inch diameter wheels and securing proper clearance between the brake parts and the skid chains. The axle is equipped with 20-inch brake drums and has four 2½-inch wide internal brakes. This design gives ample brake area and at the same time permits the use of 36-inch wheels with anti-skid chains, without interfering with any of the brake parts. This design also has the added advantage of protecting the brake drum and lining from mud and dirt, which works much damage with these parts.

No provision is made for radius or torsion rods. The braking and driving torque are taken through the springs.

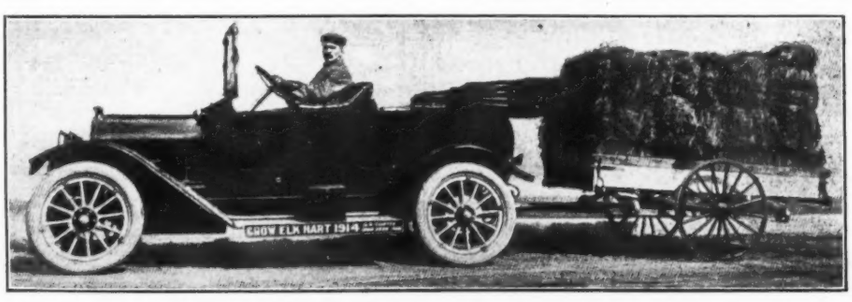


Fig. 8—Curtis auto trailer hauling a load of hay